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ABSTRACT

The Early Childhood Longitudinal Study, Birth Cohort 2000 (ECLS-B) is a study that will assess children's health status and their growth and development in domains that are critical for later school readiness and academic achievement. This paper is one of several that have been prepared in support of ECLS-B design efforts. It is anticipated that three waves of data will be collected from families of children born between January and December 2000, with supplementary data collected from child care providers. Several options remaining to be decided are addressed, including identifying the primary respondent and other respondents, the assessments to be used, and how to collect data on variables such as other children in the family. The following eight major domains have been identified for the study: (1) demographic background; (2) family organization, composition, history, and turbulence; (3) family processes; (4) child care; (5) child characteristics; (6) child outcomes; (7) early health care, feeding patterns, nutrition, and insurance; and (8) distal constructs, such as neighborhood characteristics. Each of these domains is discussed. (Contains 485 references.) (SLD)

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A Birth Cohort Study: Conceptual and Design Considerations and Rationale

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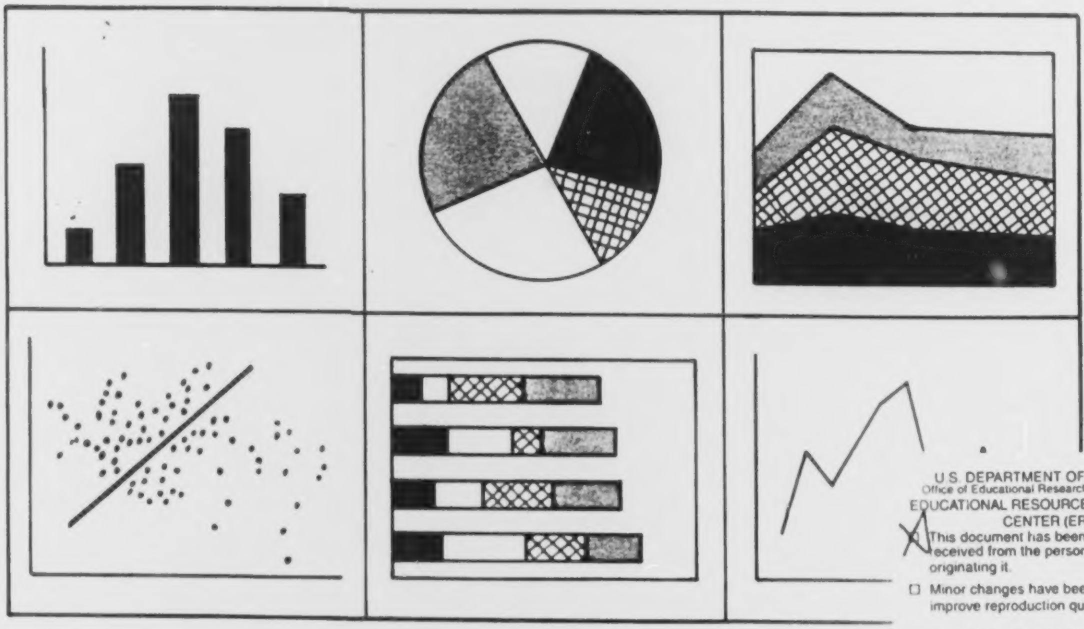
January 1999



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A Birth Cohort Study: Conceptual and Design Considerations and Rationale

Working Paper No. 1999-01 January 1999

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Foreword

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January 1999

Preface

The **Early Childhood Longitudinal Study, Birth Cohort 2000 (ECLS-B)** is a new study that will assess children's health status and their growth and development in domains that are critical for later school readiness and academic achievement. It will follow a large, nationally representative sample of infants from birth through first grade. The ECLS-B is the product of a collaboration of many sponsoring agencies. The National Center for Education Statistics (NCES) is working with the National Center for Health Statistics, the National Institute for Child Health and Human Development and other components of the National Institutes of Health, the Economic Research Service of the U.S. Department of Agriculture, the Administration of Children, Youth, and Families, and the U.S. Department of Education's Office of Special Education Programs.

Approximately 15,000 children born in the United States in calendar year 2000 will be selected for participation in the study. The sample will consist of children from different racial-ethnic and socioeconomic groups. Asian and Pacific Islander children, moderately low birth weight children (1500-2500 grams), very low birth weight children (under 1500 grams), and twins will be oversampled. Baseline data will be collected when children are approximately nine months of age. Data will be collected again when children are 18-months, 30-months, and 48-months of age, and when they reach kindergarten and first grade. Data about children's early development, families, health and health care, child care, and early education programs will be collected primarily through in-home interviews with the children's parents. These data will be supplemented with data collected at regular intervals from children's child care and early education providers and when they reach school age from schools and teachers. Children will also participate in a variety of activities designed to assess their development in physical, language, cognitive, social and emotional domains.

This paper is one of several that have been prepared in support of ECLS-B design efforts. It is our hope that the information found in this paper not only will provide background on the development of the ECLS-B, but that it will be useful to researchers developing their own studies of young children, their families and educational experiences.

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Introduction

Policy makers, researchers and parents have increasingly become aware of the importance of the early years of childhood for school readiness and later academic success. Many of the characteristics and abilities that children bring into the kindergarten classroom develop while they are infants and toddlers. Indeed, the circumstances surrounding conception and pregnancy may have long-term implications for children's physical, cognitive, social and emotional development. Existing research suffices to indicate that development in the first three years is critical to children's subsequent development, and that there are multiple sources of influences on this early development. Very recent findings on early brain development (Begley, 1997; Brooks-Gunn, 1995; Carnegie Corporation of New York, 1994; Shatz, 1992) further underscore the importance of the early years. Yet at the same time, the existing research on early development has serious shortcomings, especially in the area of linkages between very early development and later academic success. Our capacity to draw firm conclusions is limited by several shortcomings of existing early childhood and educational research.

Among the limitations of the existing research is the fact that studies on the first three years of life tend to be limited in the range of constructs examined in any single study. An ecological model of early development hypothesizes that children are influenced by multiple factors from a number of contexts (including their families, child care contexts, and neighborhoods), which can have important implications for their development (Bronfenbrenner, 1979). A research study that is able to address multiple factors simultaneously would be an important contribution to the field of early development, helping especially to assess the relative importance of levels of the ecological model, how their influences combine and interact, and how their relative importance changes over time.

Second, the majority of studies to date in both the developmental and educational literatures have been conducted with relatively small and selective samples that are often exclusively middle class and white. When minority children are studied, they are usually from disadvantaged backgrounds, so that race and ethnicity tend to be confounded with socioeconomic status (Hagen & Conley, 1994; Scott-Jones & Nelson-LeGall, 1986). Even the largest U.S. longitudinal study of young children to date, the National Longitudinal Study of Youth Child Supplement (NLSY-CS), has less than adequate numbers of middle class black families, Latino families, Asian families, or Native American families to permit most types of analyses. A study with a representative sample of children would permit us to ask questions about whether and how the factors that shape development and academic achievement differ across key subgroups.

Third, most research conducted on the early years of life is cross-sectional in nature and often relies on retrospective reports of family experiences from the time of the child's birth. A prospective, longitudinal focus is needed in order to capture family experiences at or near the time of the birth and the influence of changes in experiences in multiple domains on child outcomes. In addition, more up-to-date work is needed on samples experiencing the greatly changed realities of life in the 1990s.

In addition, many studies focus primarily on a single outcome domain, for example, health, cognitive development, or behavior, without explicitly incorporating influences from other domains. For example, studies of school success may neglect the influence of health, disabilities, and health care on achievement (Zill, Peterson, & Moore, 1984), while studies of health may fail to examine the effects of behavior problems on health care use (Zuckerman, Moore, & Glei, 1996). Even when multiple domains are included, data on social and emotional well-being are inadequate.

Thus, despite the large volume of work on the early years of life, conceptual and substantive gaps exist in the available body of research. Even existing national data collection projects would have to be significantly augmented (in a piecemeal fashion and at considerable cost) in order to address the many gaps in the existing data on early childhood development and school readiness (Brooks-Gunn, Brown, Duncan, & Moore, 1995). These shortcomings highlight the critical need for large, representative longitudinal studies of families with children in their first years of life, making use of research expertise in multiple disciplines. The gaps also call for more attention to concepts that may not have been well-studied in the available research. The following section highlights several social changes and research issues related to these changes.

Changes in Fertility

One such social change is the rising incidence of nonmarital childbearing, which accounts for nearly a third of current births (National Center for Health Statistics, 1996). Important research issues include the influence of family structure at birth on children's early development and school readiness (McLanahan, 1995; McLanahan & Sandefur, 1994), and the effect of unintended fertility on the mother-child relationship (Barber, Axinn, & Thornton, 1997).

Teenage childbearing represents a topic of longstanding concern for the public and for policy makers (National Campaign to Prevent Teen Pregnancy, 1997). Although rates have declined during the last several years (National Center for Health Statistics, 1997), the rate of childbearing among adolescents remains high compared with other nations (McElroy & Moore, 1997). While researchers agree that much or most of the consequences associated with early childbearing reflect the disadvantaged life circumstances of the adolescents who become pregnant, the children born to adolescents appear to be disadvantaged relative to other children (Hardy, Shapiro, Astone, Miller, Brooks-Gunn, & Hilton, 1997; Maynard, 1997). Longitudinal data for a large and representative sample of children born to younger and older women will support examination of the factors that foster more positive development among children born to young parents.

Changes in Family Structure and Behavior

Changes in living arrangements, marriage and divorce during the early childhood years call for new data and research on the implications of family composition, including not only kin and children's legal and residential relationship with the biological father, but their relationships with other men, including other relatives and other partners of the mother (Working Group on Conceptualizing Male Parenting, 1997). The crosscutting topic of fatherhood has been relatively neglected by the research community, despite its relevance to important issues such as nonmarital fertility, maternal employment, and child care (Child Trends, 1997a; Work Group on Targets of Opportunity and Trade-offs, 1997). The lack of an extant body of research on representative or even diverse samples of fathers highlights the need for new conceptual and methodological work (Working Group on the Methodology of Survey Research on Fathers, 1997).

Another significant trend is the increasing proportion of mothers of young children who return to full-time or part-time employment when their children are very young. As a result, a high and rising proportion of children in the U.S. spend time in nonmaternal care, and an increasing number of them enter this care at a very young age. The National Household Education Survey (NHES) found that nearly half (45%) of children under age 1 receive non-parental care on a regular basis (West, Wright, & Hausken, 1995). Initial results from the National Institute of Child Health and Human Development (NICHD)-

supported study of child care suggest that employment per se is less of an issue for early child development than is quality of substitute care arrangements (NICHD Early Child Care Research Network, 1997a, 1997b). The fielding of a large, diverse, and nationally representative sample will allow additional examination of the circumstances under which child care either supports or undermines the development of very young children.

Changes in National Demography

Understanding the implications of immigration for the children of immigrants represents another critical research challenge. Among newborns, nearly one in five (18.5 percent in 1995) has a foreign-born mother (S. J. Ventura, personal communication, 1997), and these parents come from varied countries around the world (National Center for Health Statistics, 1997). Although unemployment generally tends to be higher among immigrants than among native-born persons, the educational backgrounds of recent immigrants tend to be quite bimodal, with higher proportions of immigrants lacking a high school degree and higher proportions holding college or graduate degrees than found among native-born Americans (Espenshade, Fix, Zimmerman, & Corbett, 1996-7). Thus, immigrants are a significant and diverse component of the American childbearing population and one that will account for a substantial portion of the preschool and school-age population and the future labor force. Understanding the factors that affect the development of the children of immigrants, in and of itself and in comparison to the development of various groups of children of native-born parents, represents an important topic for a study of young children.

A related issue of special concern to those interested in the educational success of children born to immigrant parents is children's proficiency in spoken English once they reach school age. Schools around the country are grappling with whether and to what extent they should provide classroom instruction in languages other than Standard English. A new, nationally representative longitudinal study of a birth cohort will potentially allow for multiple assessments of children's linguistic abilities across the language-learning years, leading up to kindergarten entrance. Such assessments, combined with data on language development obtained in the Early Childhood Longitudinal Study (ECLS)-Kindergarten study, will provide critical information to educators and policy makers concerned with the need for providing non-English instruction and English as a Second Language (ESL) classes in school settings.

There is a general concern that certain subsamples of the nation's population, such as Native Americans, have historically been under-represented or excluded from previous federal statistical data sets (Hofferth, 1995). Furthermore, previous studies that have included subsamples of minority groups (e.g., the NLSY Hispanic subsample) are now no longer current given ongoing immigration and changes in immigration patterns (Brooks-Gunn, Brown, Duncan, & Moore, 1995). In a new fielding of a nationally representative sample of children, it will be important to oversample minority groups such that sufficient numbers of children can be disaggregated into meaningful ethnic/racial subgroups (Hofferth, 1995).

Given the gaps in existing research and the major changes that are occurring in the circumstances of families with young children, it is necessary to develop new data resources that both draw upon the available published literature and strive at the same time to begin to go beyond this body of work.

Changes in Public Policies and Programs

Another reason to start moving beyond the body of available theory and the published literature is the fact that large and important policy changes are under way in this nation. Although within an ecological perspective, public policy decisions are distal influences on children's development, they are nonetheless significant factors in determining the context for child development for all children residing in the United States (Zaslow, Tout, Botsko, & Moore, 1997). Data and research are needed that help policy makers understand the implications of rapidly changing programs and public policies (Chase-Lansdale & Brooks-Gunn, 1995; Duncan & Brooks-Gunn, 1997). Since poverty and welfare receipt are particularly prevalent among families with young children (National Center for Children in Poverty, 1996; Department of Health and Human Services, 1997), any effects of welfare reform for children are quite likely to be manifested in a sample of young children. In fact, it is likely that very young children may be the most affected by changes in daily family life associated with new welfare policies. Previous policies required mothers of preschoolers to participate in self-sufficiency activities. New policies place more stringent work requirements on mothers of still younger children. Consequently, children born in the late 1990s are a critical group to look at--not only because of recent changes in welfare policy, but also because of concerns about the lack of quality child care for infants and toddlers.

Data from a longitudinal birth cohort survey of children are not experimental and cannot therefore provide definitive evidence of causality, nor can they speak to the implications of policy changes for older children. However, the fielding of a large-scale sample of very young children can represent an important resource for researchers, policy makers, and citizens. In particular, selecting a sample that will represent children in most or all states and in all locales (i.e., urban, rural, suburban) provides a way to take advantage of the natural variation occurring in welfare policies in order to explore how differential policies are related to the development and well-being of young children. For example, some states are implementing "family caps" in which benefits remain stable despite the birth of additional children, while other states are continuing to increase benefit levels when additional children are born. Such variation creates an opportunity to examine the implications of this much-debated policy initiative on the development of young children.

Welfare represents a prominent example of a long-term entitlement program that is currently undergoing rapid restructuring. States have and will continue to diverge greatly in their approaches to implementing welfare reform, creating a "laboratory" in which state variation can be related to changes in the behavior of families and potentially to the well-being of young children (Knitzer & Bernard, 1997; Zaslow, Moore, Coiro, & Morrison, 1995). Additionally, in no state will any but an extremely disadvantaged subset of welfare recipients be allowed to remain on welfare for more than five years, and many states have set shorter lifetime welfare limits. The implications of these time limits for the development of young children--especially developmental outcomes related to children's school readiness--can be monitored across states.

Equally relevant to young children are changes in nutrition and health programs. Cuts have been enacted in Federal funding for food stamps. Changes have also been made in the Disabled Children's program. The Individual Functional Assessment comparable severity standard has been eliminated, making many children with medical impairments ineligible for Supplemental Security Income (SSI) benefits. However, at the same time many states are expanding their health coverage of children in low-income families, and nutrition programs for infants and toddlers, such as Women, Infant, and Children (WIC), have sustained their funding. A recent evaluation of several of these expanded programs for low-income children found that Food Stamps, WIC, and school nutrition programs are effective in reaching many eligible children (Devaney, Ellwood, & Love, 1997). Many of the changes in public assistance programs (such as the just-enacted increases in Medicaid coverage for children) are still taking shape. In addition, although increases in funding for child care have occurred, it is not yet known whether these increases will be sufficient to provide care for the many children who need it as a result of welfare reform.

nor is it known whether this care will be stable and of sufficiently high quality to support the developmental needs of very young children. Also, newly arrived legal aliens have been made ineligible for a number of programs (Rosenbaum & Darnell, 1996). However, with the exception of Virginia, all states have opted to continue Medicaid assistance to those already receiving this benefit, and to newly arrived legal aliens after five years (DC Family Policy Seminar, 1997). The status of children's health and nutrition as they reach school age will have further implications for school-based programs that provide free or reduced price breakfast and lunch.

The requirements in the welfare law to greatly strengthen paternity establishment for babies born outside of marriage and the more stringent enforcement of child support obligations (Garfinkel & McLanahan, 1990; Levin-Epstein, 1996) represent additional policy changes with potential implications for family income and father/child interaction, as well as for father/mother interaction. The role of the extended family in assisting families with young children is not well understood and may be particularly important in a time when public supports are either changing or declining.

Thus, major changes are occurring in society, in families, in the social supports provided to families, and in the public's expectations of parents. How these forces will affect young children's readiness for school and future life success as the nation moves into a new century is a complex but important issue.

Challenges and Options for Study Design and Measurement

The challenge of the birth cohort project is to provide rich and detailed information for a large, representative sample at a reasonable cost. The frequency of data collection, the number of persons who provide data, the breadth of data collected, and the methods employed to obtain data will need to be balanced against available resources.

Several decisions about study design and measurement for the birth cohort study have already been made (National Center for Education Statistics, 1997). It is anticipated that within the first three years of this five-year study, three waves of data will be collected from the families of children born between January and December, 2000. It is planned that the initial wave of data will be collected within the first nine months of each child's life, with later waves being collected annually. The individual most knowledgeable about the child will represent the primary respondent about the child, and the mother is generally expected to be this individual. However, information about the biological father and a residential father-figure, if any, is also important (Day & Marsiglio, 1997). Therefore, data collection with the biological father and/or the residential father of the child is also being considered. Beginning at ages 2 ½ to 3, data will be collected directly from children. Because one of the main objectives of this birth cohort study is to examine children's transitions to nonparental care and education programs, data will also be collected from the child care provider, if any, at least once but no more than twice during the first three years of the study. While development is to be viewed from a holistic perspective, the relative contributions of various circumstances and experiences to children's school readiness is of considerable substantive interest.

Despite the above specifications, many decisions about study design and measurement strategies remain to be made. Different disciplines tend to give rather different weight to varied substantive topics and data collection strategies, suggesting the value of an interdisciplinary discussion. Several options to be addressed are discussed briefly below.

The Primary Respondent. Since babies are too young to provide survey data, a person knowledgeable about the child will need to provide information. Fieldwork will be smoother if the same parent or adult is identified and interviewed at each wave. Traditionally, mothers have provided data about children, but this tradition was challenged in the National Survey of Families and Households. However, when data were examined, it was determined that mothers, in general, provided superior data to that provided by fathers and others (Sweet, 1996). In addition, when asked who is most knowledgeable, most households nominate the mother (Child Trends, 1997b). Nevertheless, where there are topics on which the mother will not be the most knowledgeable, there may be gains to having data from a second informant when possible. There will also be situations in which the primary caregiver changes over the course of the study for a particular child (e.g., a child may be moved into foster care or go to live with the other biological parent). When caregiving situations change, it is best that the primary respondent change accordingly.

The Father. Although mothers are generally the best informants about the child's experiences and care, fathers can and often do represent a critical source of information about the child's world, whether or not they are married to the mother and whether or not they reside in the child's home (Greene, Hearn, & Emig, 1996). Fathers' contributions to the lives of their children are important and include child care and nurturance (e.g., time devoted to direct care, play, and shared activities), human capital (e.g., skills, knowledge, and traits that foster achievement), financial capital (e.g., money, goods, and experiences purchased with income), and social capital (e.g., family and community relations that enhance children's cognitive and social development) (Amato, 1996; Coleman, 1988, 1990; Day & Marsiglio, 1997; Hagan, MacMillan, & Wheaton, 1996).

Although nearly a third of current births occur to unmarried mothers (National Center for Health Statistics, 1997), many unmarried mothers nevertheless reside with their child's biological father (Bumpass & Sweet, 1989; Loomis, 1994), and a small but growing proportion of children reside with their single or cohabiting fathers (Brown, 1996; Garasky & Meyer, 1996). In addition, many other mothers are in regular contact with the father (Nord & Zill, 1996a, 1996b). Moreover, even when fathers do not reside with or visit the mother, a substantial proportion can be reached by telephone and interviewed. For example, surveys sponsored by the Bureau of Justice, such as the Survey of Inmates in State Correctional Facilities (SISCF), the Survey of Inmates in Local Jails (SILJ), and the Survey of Adults on Probation indicate that 75.9 percent of men in federal prisons and 63.9 percent of men in state prisons report themselves to be fathers (Harlow, 1994). Other fathers are in the military and might also be interviewed by telephone. In addition, several ethnographic and small-area studies include interviews with low-income nonresident fathers often deemed hard to reach, and the methods used to engage these fathers have implications for the improvement of large-scale survey design (Greene, Hearn, & Emig, 1996).

Substantial methodological, social, and policy issues exist that keep mothers from identifying the fathers of their children or reporting on their whereabouts. In addition, methodological issues surround the challenges of locating fathers with no fixed address, obtaining interviews with fathers, and collecting reliable and valid data from fathers (Working Group on the Methodology of Survey Research on Fathers, 1997). However, several important endeavors are moving forward to address these issues, including current efforts to obtain interviews with nonresidential fathers in the Panel Study of Income Dynamics directed by Sandra Hofferth and a study of fragile families being fielded by Sara McLanahan, Irwin Garfinkel, and colleagues. Results from these projects will suggest whether interviews with fathers are feasible and provide insight into how researchers can conduct such interviews.

The importance of obtaining information from residential fathers requires mention as well. At present, the involvement of fathers with their infants and toddlers is not well understood (Day & Marsiglio, 1997). Since many of the fathers who live with their biological infants will not remain in the household for the child's entire childhood, the opportunity to interview these men while they are accessible might be considered. Information provided by the father about his background is likely to be more reliable than information provided by the mother, and his perspective regarding the circumstances of conception and pregnancy and the experiences of caring for an infant may provide different and critical insight relative to the information provided by the mother. It may be desirable to conduct cognitive testing of the father, as well as the mother; data on cognitive attainments of mothers obtained in the National Longitudinal Survey of Youth have been widely used and have been proven to be important predictors of children's cognitive attainment (e.g., Luster & Dubow, 1992; Moore & Snyder, 1991).

Data Collection Mode. It is anticipated that this study will use both in-person and telephone data collection methods, to realize the advantages of both approaches and minimize the costs associated with each approach. Specifically, the initial data collection will consist of an in-home computer-assisted personal interview (CAPI) with the primary caregiver when the target child is no more than nine months of age. An initial in-person survey is necessary for establishing rapport with the respondent, and for obtaining contact information that would support subsequent telephone interviews. The survey interviewer will also be able to supply additional information about the neighborhood, the household and the parent's interaction with the child at this initial time point. It is anticipated that, starting in the third year of the study, children will be asked to participate directly in activities designed to measure important domains of development. The decision to gather data directly from the child necessitates that in-home data collection efforts (CAPI) be undertaken in Year 3, during which time child assessments will be conducted in addition to the caregiver interview.

Later interviews may be conducted in person or by telephone or mail. Telephone data collection (specifically, computer assisted telephone interviewing or CATI) is substantially less expensive than in-person data collection; however this mode of data collection can also constrain the amount and type of data gathered. In addition, telephone response rates tend to be lower than response rates obtained during in-person surveys (Fowler, 1993). Moreover, response rates seem to vary considerably from state to state, and response rates may be further declining at present (Kenney, 1997), possibly due to public frustration with telephone marketing. Another drawback of a telephone data collection format is that self-administered questionnaires cannot be used. While it is possible to ask relatively sensitive questions over the telephone, supplying the respondent with neutral response categories which could not be interpreted by someone in the room, it cannot be guaranteed that someone is not on an extension phone. Also, respondents may be reluctant to share information with a person they cannot see. Nevertheless, telephone interviewing provides a relatively inexpensive and efficient alternative to in-person data collection.

Data collection by mail is also a possibility. However, it should be kept in mind that response rates for mailed data collection instruments tend to be very low (Fowler, 1993) and may not afford privacy for the respondent, since they can be read while they are being completed or before they are mailed. Nevertheless, returning special questionnaires by mail, such as a self-administered questionnaire completed by non-residential fathers who visit the family, may be a strategy to be explored in combination with other approaches. Decisions about data collection modes throughout the study should be made in a way that balances the analytic goals of the study with the need to control data collection costs.

Assessments. While the infant or toddler is too young to be interviewed, it is possible to conduct assessments with even very young children. However, conducting valid assessments of health, cognitive functioning, or socioemotional development among very young children is demanding, in terms of time in the home and interviewer training. Indeed, some assessments may be sufficiently complex that it would not be appropriate to expect survey interviewers who lack formal training in child development or health assessment to conduct the procedure. On the other hand, contracting with experts would be prohibitively expensive, given the size of the sample that is contemplated for the birth cohort study. However, as is done in the NLSY-CS, there may be one or two brief assessments that can be conducted by well-trained interviewers even with fairly young children. In addition, some assessments such as the Bayley could be conducted shortly after birth in a medical setting or periodically by a physician or other health practitioner. Conducting other types of health assessments might be considered. Survey interviewers can measure height, weight, and head circumference over time with proper training and monitoring. Additionally, given careful training, interviewers may be able to conduct screening tests for health problems as well as developmental delays.

There may also be assessments that are appropriate to conduct among a sub-sample of the families in the study, either for methodological or substantive purposes. Methodological goals would include validating brief, mother-report measures or interviewer ratings with measures obtained using observational procedures or more lengthy assessment procedures. Substantive goals might include an embedded observational study of maternal warmth, which is relatively difficult to assess with mother-report measures, or maternal teaching strategies, which are difficult for a mother to describe about herself, or mother-father interaction, which may be more objectively ascertained with observational procedures than by asking either the mother or the father individually. Careful consideration should be given to identifying critical assessments that can be conducted by well-trained survey interviewers, methodological studies that need to be embedded in the larger study, and intensive or in-depth studies that need to be embedded within the larger sample.

Child outcomes can be measured directly, by assessment of the child, or by report of the parent and the child care provider. However, for that minority of children who have no child care provider, a second source of survey data on child outcomes will not be available, enhancing the importance of direct assessments.

The Interviewer. Although survey interviewers only rarely have graduate degrees in social science research, with careful training, interviewers can provide important information about the neighborhood, physical structure of the home, and even about aspects of the parent and about parent-child interactions. Since it is expected that interviewers will visit the home for at least the initial interview, they will have an opportunity to see the neighborhood and can code it for noise, litter, presence of play areas, traffic, and whether buildings are well maintained. Since interviewers will enter the home, they will also have an opportunity to assess various aspects of the physical structure, as done in the National Longitudinal Survey of Youth Home Observation for Measurement of the Environment-Short Form (HOME-SF) Scale. Moreover, if the child is present for at least part of the interview, the interviewer can rate components of the parent's interaction with the child, which is also done in the HOME-SF.

The HOME-SF scale is an abbreviated version of the HOME Scale developed by Caldwell and Bradley for use in studies of child development (Caldwell & Bradley, 1979). In the abbreviated scale, interviewer ratings of the home's physical appearance (e.g., dark, cluttered), mother-child interactions (e.g., mother kissed child, mother praised child, mother spoke to child in complex sentences), and material possessions (e.g., presence of books and tapes) are scaled along with maternal reports of how often she and the child engage in certain activities together (e.g., go to a museum, read) to provide information on the emotionally supportive and cognitively stimulating aspects of the child's home environment. The HOME-SF is reliable and has been both widely and successfully used as a predictor of children's development (Moore & Snyder, 1991; Mariner & Zaslow, 1997). Findings examining interviewer ratings and maternal report items indicate that both are important in predicting child outcomes (Zaslow, Coiro, Moore, Blumenthal, & Brown, 1995). The training of interviewers for such ratings is an important issue.

Child Care. Recent data indicate that a majority of infants and toddlers now attend child care. NHES found that nearly half (45%) of children under age one receive care from someone other than their parents on a regular basis (West, Wright, & Hausken, 1995). Similarly, the NICHD Study of Early Child Care (NICHD Early Child Care Research Network, 1997b) found that 64 percent of the sample were in nonmaternal care for at least ten hours a week at age nine months. For children of employed mothers where the child is less than one year of age, 59 percent were cared for outside the home, with 19 percent in an organized facility in 1993 (U.S. Bureau of the Census, 1995). According to the NHES study, the degree to which children attend child care increases rapidly across the preschool years: by age one, half of children are in nonparental care (50%), for age two the figure is 54 percent, for age three it is 68 percent, for age four 68 percent, and at age five, 84 percent were receiving such care (West, Wright, & Hausken, 1995).

Given the passage of the new welfare reform legislation, more low-income mothers with very young children will be in the labor force, thus increasing the demand for child care providers. Moreover, while the family clearly represents the most important influence on the development of the young child, child care has been found to represent an important influence as well (NICHD Study of Early Child Care, 1997). In particular, the quality of the care provided can affect the development of young children, and may be particularly important for children from low-income families (Zaslow, 1991). Thus, information on child care represents an important additional arena for data collection and another topic on which data might be obtained from a source other than the primary respondent.

Researchers have found that the mother can reliably provide information on some but not all aspects of the child care arrangement (Zaslow & Oldham, 1997). For example, mothers are a good source of information on the number and type of child care arrangements used and child care costs, while care providers supply more accurate information on caregiver education and training, group size and ratio, licensing and certification, and other provider characteristics.

Several key issues must be addressed in a research design which incorporates the complexity of child care arrangements for young children. Children often attend more than one form of child care during a given period, and detailed data should be collected on any form of care in which a child spends a substantial number of hours. Children may also experience several shifts in the type of care they attend over the first few years of life, due to shifts due to normal child development, but also due to changes in child care provider availability or changes in parents' schedules. Frequent shifts in child care providers have been shown to have a negative effect on young children (Howes & Stewart, 1987; NICHD Early Child Care Research Network, 1996b). Child care calendars are an effective way of collecting information on both shifts in care and multiple forms of care in a given period; similar to the life history calendar, they structure the information in a way that aids respondent recall.

Besides maternal reports, potential data collection strategies include telephone interviews with caretakers conducted at two time points during the first three years of the study. Most infants and toddlers are in informal types of care, which presents challenges both in designing questionnaires that suit varying environments and in contacting providers. Expensive data collection strategies may not be feasible for the full sample, but substantively significant sub-studies may be fruitful. For example, observational data may be obtained at the child care site for a sub-sample of children.

Retrospective Data. Another questionnaire design issue, and an issue of priority for survey time, will be how much retrospective data should be collected about the mother, the father, and their experiences prior to the birth of the child. An additional questionnaire design issue is how much information should be collected about the circumstances of conception, such as the wantedness and intendedness of the conception, about health care and nutrition during pregnancy, and about the delivery of the child. Since data collection during pregnancy or shortly after delivery is unlikely to be feasible, it will be essential to obtain some data to control for background factors and selection effects. However, the amount of retrospective data to be collected must receive critical consideration.

Income Tax Data. Many of the public and private benefits that affect children are no longer transmitted as direct payments to families, but rather work through the tax code. For example, the nation's largest income transfer program is now the Earned Income Tax Credit (EITC). Also, the child credit and the child care tax credit both operate through the income tax system. Because many families, particularly low-income families, do not complete their own tax forms (R. Blank, personal communication, 1997), many survey respondents are unable to report whether they received any or all of these tax credits.

To obtain information about these public income supports for child rearing, it would be desirable to have access to family income tax records. Access to such data would require permission from the parent respondent and provision of the appropriate Social Security number. In addition, cooperation with the Internal Revenue Service would be needed. Admittedly, these represent substantial obstacles, but gains from having such data could be so significant that initial consideration of obtaining tax records might be investigated. The U.S. Bureau of the Census is currently working on a project to match income tax EITC records to person records in the Survey of Income and Program Participation. If their experience suggests this is a feasible strategy, steps to make such an activity possible in the birth cohort study might be considered during the planning process.

Other Children in the Family. Many children in a birth cohort study will be second or later born children. It will be important to obtain basic information about all children in the family, such as their number, birth spacing, age, gender, health status, and parentage. Since time and other resources for data collection are necessarily limited, how much information should be collected about the development of these other children is another issue that requires careful consideration.

Twins. Another design element that can greatly expand the ultimate utility of the data is the inclusion of twins in the study. One in every 85 births is a twin birth. One third of twins born are identical, one-third are same sex fraternal, and one-third are opposite sex fraternal (Plomin, DeFries, McLean, & Rutter, 1997). The field of behavioral genetics has mushroomed in the last twenty years to the point that it now provides a provocative and credible challenge to the nurture-dominated view (e.g., Rowe, 1994; Rowe & Teachman, 1997). Key evidence for models that include both nature and nurture is provided by comparisons of the characteristics of individuals with known but varying degrees of genetic similarity. Monozygotic twins, dizygotic twins, other full siblings, half- and step-siblings, and unrelated children reared in the same families constitute the crucial comparison groups. Developmental measures of physical and mental health, cognitive ability, and personality are key characteristics of these individuals that researchers have compared. Also, to the extent that children themselves construct their learning and other environments, environmental characteristics can also be compared.

All of the designs contemplated for the birth cohort study will obtain a wealth of environmental and developmental measures on the children. If both infants in twin pairs are selected into the study, then enormous analytic power can be added to the data at relatively low cost. Since basic information about the parents and the home will be collected anyhow, the incremental cost of studying a second child in a family is relatively low. Oversampling twins does have an opportunity cost in reduced precision for estimates based on the full birth cohort sample, but that cost is small relative to the large analytic benefits of including both twins in twin pairs into the sample (G. Duncan, personal communication, July 1997). A relevant model of such an approach is the NICHD-funded Adolescent Health Study (ADD Health). ADD Health viewed genetic-based oversampling as a key component of the study design, yet the data also provide efficient representative estimates of children attending middle schools and high schools.

Conceptual Framework

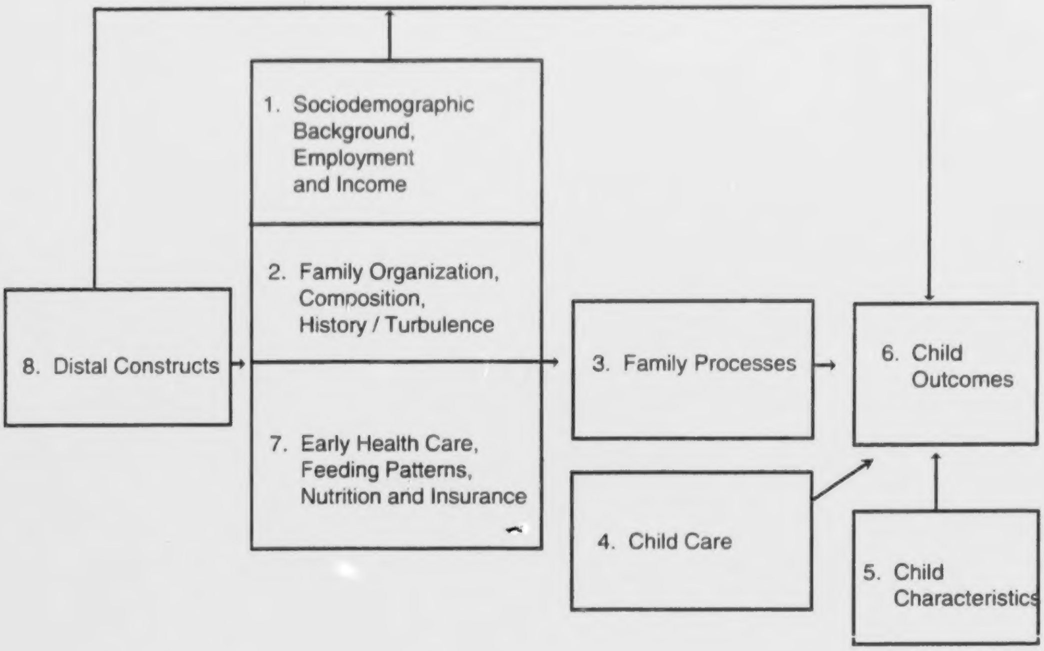
Ecological theory represents a useful conceptual framework for a birth cohort study (Bronfenbrenner, 1977, 1979, 1986, 1989). An ecological perspective posits that individual development is influenced by multiple levels of influences ranging from home, child care, and early education environments (the microsystem), to economic, social, educational, legal, and political systems (the macrosystem).

Figure 1 provides a graphic representation of a proposed conceptual framework for this research study. Note that its function is heuristic and does not include all hypothesized associations among domain areas. The model posits that a variety of factors may influence children's development in the infancy/toddler period. Children's characteristics include physical health, disabilities, gender, and temperament. As shown in the figure, we have designated the most proximal influences, outside of child characteristics, to be family processes and child care because both of these domains impinge directly upon the child. Examples of family processes include parental warmth, discipline, play activities, verbal communication and other forms of cognitive stimulation. The child care domain includes, for example, age entering child care, the type and amount of care, and the quality of care.

Other domains hypothesized to influence child outcomes include sociodemographic background, parental employment, and income; family organization, composition, and turbulence; and early health care and nutrition. These factors may affect children's development indirectly through family processes or they may directly affect the child's development, as, for example, nutrition, which contributes directly to children's growth and development. Finally, we include a domain of distal constructs that are also hypothesized to influence child outcomes, both directly and indirectly. These include public policies, such as welfare, Medicaid and Food Stamps, and societal level factors such as the labor market and pollution. These kinds of distal factors need not be measured in parent questionnaires, but can be appended to the data file from other sources. For example, welfare policies can be identified and attached to data files as a function of the state of residence.

There is no ordained or magical ordering to the domains outlined in the figure. Indeed, their causal influences may be reciprocal and non-recursive. The value of the model lies in forcing common recognition that the child is the focus of the study, that varied factors affect the child's development, that influences on children are both direct and indirect, and that some factors that may seem quite distant from the child's life can have an effect through factors that more directly impinge upon the child, such as the quality of parenting and child care the child receives.

Figure 1. Conceptual Framework for a Birth Cohort Study: Proposed Influence of Major Domains on Child Outcomes


1. Sociodemographic Background, Employment and Income
2. Family Organization, Composition, History / Turbulence
7. Early Health Care, Feeding Patterns, Nutrition and Insurance
8. Distal Constructs
3. Family Processes
6. Child Outcomes
4. Child Care
5. Child Characteristics

Thus, we have identified a total of eight major domains and associated construct areas for this study, summarized in table 1:

Table 1: Major Domains and Construct Areas for a Proposed Birth Cohort Study

1. Sociodemographic Background, Employment and Income:
    a. Age, Gender, Race/ Ethnicity
    b. Immigration History
    c. Grandparent Characteristics
    d. Parents' Education and Training; Educational Aspirations for Selves; Cognitive Attainment
    e. Employment
    f. Income & Wages
    g. Public Assistance

2. Family Organization, Composition, History/ Turbulence:
    a. Household Composition
    b. Marital and Cohabitation Status/ History
    c. Child's History of Living Arrangements
    d. Parents' Childbearing History
    e. Circumstances of Conception, Pregnancy & Delivery
    f. Child's Health Status at Birth

    g. Parental Psychological Well-Being
    h. Parental Health and Health-Related Risk Behaviors

3. Family Processes:
    a. Cognitive Stimulation: Activities
    b. Cognitive Stimulation: Materials
    c. Parents' Expectations for the Child's Development
    d. Discipline
    e. Warmth, Physical Affection & Emotional Supportiveness
    f. Structuring of the Home Environment
    g. Family Routines
    h. Attitudes about Culture, Ethnicity & Race
    i. Morality, Spirituality & Religiosity
    j. Child Relationships with Non-Residential Biological Parent, Grandparents & Other Kin
    k. Sibling Characteristics; Sibling Adjustment to Baby
    l. Parenting and the Neighborhood; Family Involvement with Neighbors, Friends & Community
    m. Parental and Other Family Relationships
    n. Gender Typing
    o. Family Time Use

4. Child Care:
    a. Type, Cost & Travel Time
    b. Extent
    c. Quality
    d. Consistency/ Turbulence

5. Child Characteristics:
    a. Temperament
    b. Health Limitations & Disabilities

6. Child Outcomes:
    a. Health of Child; Physical Growth; Motor Development; Child Safety
    b. Child's Cognitive Development
    c. Child's Socioemotional Development
    d. Attachment

7. Early Health Care, Feeding Patterns, Nutrition & Insurance:
    a. Early Health Care Practices
    b. Health Insurance and Care Usage

8. Distal Constructs:
    a. Neighborhood Resources
    b. Neighborhood Quality & Safety
    c. Housing-Related Health Risks

Each major domain includes several construct areas, each of which is represented by a separate table page (or pages) in the attached construct grid. The construct grid follows the order of the list of major domains and construct areas. Because of the detailed nature of the construct grid, we have included cross-references on several construct pages, to other relevant constructs. For example, Household Composition (construct 2a) is linked to several other constructs, including 1a) Age, Gender, and Race/Ethnicity. Note that instead of creating a separate domain for fatherhood issues, we have incorporated father involvement measures into several of the parenting domains and into their accompanying rationales.

Along with the proposed construct grid, we have included a document addressing the rationales that support the inclusion of these various constructs in the design of a birth cohort study. These rationales are based on the existing body of research on early child development and educational outcomes, which, despite important limitations, provide substantial guidance regarding the appropriate constructs to be addressed in a longitudinal survey of a birth cohort of children. Although our initial purpose was to focus on aspects of the family and family processes that need to be assessed in a study of very young children, we have included a set of rationales for each construct area in each domain. Thus, the discussion of family process issues is necessarily more fully developed than the discussion of more distal factors, which are included in the interest of representing the full or at least a broad array of domains and constructs.

Our initial goal was also to be expansive and inclusive in our task of identifying important domains and constructs. Indeed, the potential list of constructs to be assessed is already daunting. Narrowing down the potential set of constructs to a manageable number represents a challenging and necessary future task.

Similarly, the selection of specific measures represents an important challenge. Since most studies to date have been small-scale and intensive, in many cases measures appropriate for use with infants and toddlers and families with young children in large-scale surveys are not currently "on the shelf." In addition, measures appropriate for the diverse populations included in large-scale surveys are in short supply. The current document does not address the very important topic of measures as, again, this issue is defined as a next step.

Conclusion

Many changes are taking place in this country, both in the structure and functioning of families and in the types of government programs that affect families. A new birth cohort survey would create a data set that reflects recent demographic and policy changes and would make it possible to examine the role of these changes in children's early development and school readiness.

By gathering data from birth and following children over time, analysts have an opportunity to examine the unfolding of development as processes evolve over time. Moreover, by collecting longitudinal data, analysts have an opportunity to observe the connections between changes in parental behavior and other environmental factors and changes in child health and development.

As discussed above, it is important to define development broadly, and to examine the determinants of development from an ecological perspective. Accordingly, the attached construct grid and accompanying rationales represent an attempt to be inclusive in covering the many elements that affect child development and school readiness. Because available studies of large and representative samples of families with very young children are fairly limited, the grid and rationales both draw upon the published literature and strive at the same time to begin to go beyond this body of work.

Rationales for Proposed Birth Cohort Study

1. SOCIODEMOGRAPHIC BACKGROUND, EMPLOYMENT, AND INCOME

While the effects of sociodemographic background factors and socioeconomic status on young children's development are well known, it should be remembered that these factors do not remain fixed over the course of childhood. Even characteristics that may seem to be static (such as age of the mother at the time of the child's birth, immigration history, gender or race/ethnicity) may have varying effects at different points of the child's development. Other factors that occur early in childhood, such as family poverty spells when a child is young, have been found to have long-lasting effects (Duncan & Brooks-Gunn, 1997). In order to understand the full impact of sociodemographic background and family economic status, as well as the impact of change (as distinct from the impact of a characteristic or circumstance at a particular point in time), it is important to have a record that dates back to the earliest points in development possible. In this way the dynamic nature of these factors on child development may be fully assessed.

1a. Age, Gender, Race/Ethnicity. The circumstances of young children differ substantially by race and ethnicity. This is evidenced by differentials in prenatal care, nonmarital childbearing, poverty, and the proportion of wanted and intended births (Brown & Eisenberg, 1995; Collins & Aber, 1996; Ventura, Martin, Matthews & Clarke, 1996). Young children of color, who are more disadvantaged, on average, than white children, are more often low birth weight, have higher mortality, are in poorer health, and score lower on standardized tests in early elementary school (Brown & Eisenberg, 1995; Coiro, 1997; Collins & Aber, 1996; National Center for Education Statistics, 1994; Ventura et al., 1996). Understanding the very different experiences and opportunities of young children as a function of their racial and ethnic origin and how these differences affect early development represents a critical task for researchers who study child development.

1b. Immigration History. Beyond the importance of ethnic background, a family's immigration history has important implications for children's future development. Among newborns in 1995, 18.5 percent have foreign-born mothers (Ventura, personal communication, 1997), and these parents come from multiple countries (National Center for Health Statistics, 1996). Although unemployment tends to be higher among immigrants than among native-born persons, the educational backgrounds of recent immigrants tend to be quite bimodal, with higher proportions of immigrants lacking a high school degree and higher proportions who hold college or graduate degrees than found among native-born Americans (Espenshade, Fix, Zimmerman, & Corbett, 1996-7). Thus, immigrants are an important and diverse component of the American population and one which will account for a substantial portion of the school-age population and the future labor force. The intergenerational transmission of diverse cultural values may also be dependent on whether the grandparent or grandparents are immigrants to the United States.

Obtaining information about the country of origin of the child's parents is important. It is clear, for example, that within the broad category of Hispanic, there are major differences between groups of immigrants from Cuba, Mexico, Puerto Rico, and South American countries.

Immigrant children have varying levels of English proficiency. Three-fourths of all Asian and Hispanic eighth graders in 1988 came from bilingual families (Bradby, 1992). While two-thirds of these students demonstrated high proficiency in English by eighth grade, one third had only moderate or limited proficiency. In general, students' proficiency in English was found to be directly related to their parents' English proficiency. Fernandez and Nielsen (1986) found that frequent use of a non-English language was negatively correlated with tested achievement of Hispanic high school students, although the results of standardized tests for bilingual students may be unreliable (Duran, 1989).

Given recent welfare reform efforts, U.S. citizenship may be related to services received and children's preschool experiences. It is important to measure citizenship status and language proficiency on a regular basis, in order to capture changes in English proficiency and to update information on citizenship that may be associated with the availability of social services.

1c. Grandparent Characteristics. Research on the family life cycle suggests that families that more closely conform to the normative order of life events are more likely to have positive outcomes, or conversely, that time-disordered events may have negative effects (Jendrek, 1994; Seltzer, 1976). When teenagers have children of their own, grandparents may be younger than the norm, and often take on increased responsibilities for their grandchildren's care (Aquilino, 1996; Jendrek, 1994). There are also significant ethnic and racial differences in the roles of grandparents. For example, the grandmother often has a critical role in African-American family life, whether she is a coresident or not (Minkler, Roe, & Price, 1992). Among children of young white mothers, Moore & Snyder (1991) found that demographic characteristics of grandparents (including educational levels and family size) influenced cognitive development among children. The intergenerational transmission of values may be dependent on whether a child's grandparents are immigrants to the United States, and more specifically, on the country of origin of the grandparents. Researchers such as Ray Buriel and Marta Tienda have found that, among Mexican-Americans, some aspects of social well-being, including educational aspirations and attainment, delinquency and substance abuse, tend to decrease from the first through the third generation of immigrants.

1d. Parents' Education and Training, Educational Aspirations for Selves, Cognitive Attainment. The educational attainment of parents, besides measuring knowledge gained as a result of formal schooling, reflects "status origins" of the family. Parental attainment levels have a strong influence on the child's odds of attaining a given level of schooling, for example, completing high school or college (Hauser & Mossel, 1985; Bowles & Gintis, 1976). Possible mechanisms for the effect of parental education on child outcomes are inherited ability, access to educational resources, differences in the value the parent places on education for the child, and ascriptive biases in both the formal organization of instruction and informal social relationships within the school setting (Bidwell & Friedkin, 1988).

Parental education has been shown to predict children's success in the early primary grades (Alexander & Entwisle, 1988). Maternal education is regularly found to be a major predictor of child outcomes, with better-educated mothers having children who have more positive cognitive, health and social outcomes (White, 1982). Time use studies have shown that maternal education is a strong predictor of the amount of time mothers spend playing with children under age 18, teaching them, and taking them on outings (Hill & Stafford, 1980). Other research has suggested that the interaction between a parent and child, especially the amount the parent speaks to an infant or small child, dramatically affects the child's vocabulary development (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991).

Parental cognitive attainment is often correlated with formal educational attainment but measures knowledge and ability rather than years of schooling. Even after controlling for parental education, parental cognitive attainment is associated with children's cognitive and developmental outcomes (Moore & Snyder, 1991). Obtaining information about parental learning disabilities and difficulties that they had when they were in school is also important because many specific learning disabilities may have a genetic or familial component. In particular, having a learning disabled father has implications for sons (M. McCormick, personal communication, July 23, 1997).

1e. Employment. Parental employment status affects the amount of material resources available to the child. A meta-analysis of several studies has documented that socioeconomic status (parent occupation and education) is positively associated with the quality of stimulation that parents provide their infants and preschool children (Gottfried, 1984). Work schedules may be related to greater structuring of family life--e.g., schedules for meals, homework, bedtime. Yet, if parents experience a substantial degree of stress in association with their employment, and/or experience job insecurity and instability, this could undermine both the quality of parent-child relations and child well-being.

In addition, children with employed mothers typically spend at least some time in an alternative child care arrangement, which can affect children directly through the quality of these arrangements (U.S. Bureau of the Census, 1987; NICHD Early Child Care Research Network, 1996a). Young children (between birth and age 5) in particular are likely to experience an increase in nonparental child care (West, Wright, & Hausken, 1995). The stability, extent and quality of child care in turn have the potential to affect children's development (Hayes, Palmer & Zaslow, 1990). In addition, the extent to which a parent's employer provides fringe benefits and/or accommodates flex-time and family leave has implications for child well-being. If employed parents experience greater financial security, self-worth, and efficacy, this would be expected to have positive implications for the quality of parent-child interactions. Further, children observing their parents succeeding in employment may affect children's aspirations and optimism about the future.

Maternal Employment. How changes in the number and timing of work hours of adult women and other family members affect family life and children is a matter of considerable debate (Parcel & Menaghan, 1994a; 1994b). Some evidence suggests that very early return to work among mothers is associated with negative outcomes for children (Belsky & Eggebeen, 1991), though the evidence is mixed (Desai, Chase-Lansdale, & Michael, 1989; NICHD Early Child Care Research Network, 1996b; Smith, 1997). The possibility exists that employment will induce stress in employed mothers from overload, from difficult work hours (night, weekend, varying hours), from concern about child care adequacy, and concerns about the well-being of children caring for themselves. Employment may reduce time for the care of children, for monitoring the activities and behavior of older children, and for carrying out household responsibilities. Yet, employment and increased income may enhance parents' sense of financial security, self-worth, efficacy, and status. Similarly, employment can enhance rewarding social contacts and provide "social capital." Employer-provided fringe benefits can further enhance a family's economic security, and also enable parents to have more flexibility in how they care for their children.

While maternal employment per se is not consistently associated with child well-being in any simple manner, the congruence between mothers' work patterns and their preference for working versus staying at home has been shown to affect children. Researchers have reported with some frequency that maternal role satisfaction is a stronger and more consistent predictor of child outcomes than is mother's employment status (Zaslow, Rabinovich & Suwalsky, 1991). That is, child outcomes are more optimal when a mother is satisfied with her employment role, whether she is employed or a homemaker. Mothers' role satisfaction has been found to be associated with children's achievement in the early school years. Thus, for example, Farel (1980) found that mothers of kindergartners who were not employed but who would have liked to be employed or who felt that their working would be good for their children had children who scored lower on measures of school adjustment and achievement.

Paternal Employment. Less is known about the impact of fathers' employment on children, beyond the relationship of this employment to household income. Conger et al. (1992) in their study of

Iowa farm families showed that economic pressure affected families through increased marital conflict and decreased parental nurturance. Since men may be more strongly affected by job loss due to the expectation that they play the provider role in the family, the effects of male unemployment on children may be more severe (Simons, Whicteck, Conger, & Melby, 1990).

Recent research on fatherhood suggests that when fathers are able to contribute financially, they may be more likely to remain invested in their marital or partner relationship and to be involved with their children. For example, McAdoo (1988) observed that fathers who are able to provide for their family are more engaged and nurturing with their children than are fathers who are unable to provide economic support. Similarly, a study of 289 single, teen-mother families on Aid to Families with Dependent Children Program (AFDC) in Wisconsin revealed that the father's employment in the past year was the most salient predictor of his current involvement with his child. According to mothers' reports, fathers who worked during the past year were more likely than their unemployed counterparts to engage in various child rearing activities and to maintain high quality relationships with their young children (Danziger & Radin, 1990). These findings may suggest that employed fathers who contribute financially are comfortable with assuming the provider role and willing to assume additional parenting roles and that mothers allow them to do so (Danziger & Radin, 1990). Research on married couple families shows that young children benefit when fathers willingly remain at home to provide daily care; the effects on child well-being are much less positive when fathers become involved in daily care because they are unemployed and are forced to remain at home (Lamb as cited in Greene, Hearn, & Emig, 1996).

In large part because of society's emphasis on fathers' provider role, unemployment often negatively affects the relationship between fathers and their children. Unemployed fathers are more likely to leave or limit their involvement with their families and are less likely to form families or assume responsibility for their children born outside of marriage (Elder & Caspi, 1988; Hawkins, 1992; Wilson, 1987). Among married couples, unemployment and underemployment often produces economic hardship which leads to a stressful home environment characterized by frequent outbursts of anger and hostility from parents, especially fathers (Elder, Conger, Foster, & Ardelt, 1992).

In many cases, employed fathers have rigid, restrictive work schedules that limit their ability to spend time with their families (Gerson, 1993). Additionally, the type of employment fathers engage in affects their interaction with their wives and children. Repetti (1989) found that fathers who have highly stressful occupations tend to withdraw from their wives and to provide little child rearing support. Compared to fathers with less stressful jobs, these fathers also are more likely to withdraw from their children and more likely to exhibit anger and impatience during their interactions with their children (Repetti, 1994). On the other hand, fathers engaged in complex jobs associated with high levels of challenge and autonomy tend to discipline less harshly and spend more time helping their children, particularly their sons, develop skills (Greenberger, O'Neil, & Nagel, 1994). Overall, daily participation in child care is high among fathers in lower-level white-collar jobs and professional jobs, and lower among self-employed fathers and fathers in blue-collar jobs and middle or high management positions (Gerson, 1993).

1f. Income and Wages. Family income, net of parent education and employment, affects the family's material standard of living, neighborhood and housing quality; opportunities for stimulating recreation and cultural experiences; and the stress and psychological well-being of the parents. While studies documenting family socioeconomic status as a significant predictor of children's achievement are more rare at the primary school level (see Weikart, Bond & McNeil, 1960) than at the secondary levels, there is some evidence that family background is even more important among the younger group (Alwin &

Thornton, 1984; Duncan & Brooks-Gunn, 1997). Children from more economically advantaged households tend to be more successful in the primary grades compared to their less advantaged peers (Alexander & Entwisle, 1988).

There are many ways in which parental income level may affect the attainments, health and behavior of children (Children's Defense Fund, 1994; Duncan & Brooks-Gunn, 1997; Hill & Sandfort, 1995; Huston, 1991; Korbin, 1992). Family income can affect children because money can be used to buy things that are essential for growth and development. Money can purchase food; lack of adequate food leads to poor nutrition. Money may provide such resources as books, toys, and musical instruments that facilitate learning. Money can also enable participation in child care settings, activities and lessons that support positive development. Lack of resources to purchase toys or good quality child care may mean that low-income children do not have as many stimulating experiences (such as reading, playing learning games or playing musical instruments) as do children in more affluent families. Money can also purchase health insurance and health care, which are associated with positive health outcomes among children and families. Money also may provide for greater safety and stability. A continual struggle for resources may lead children in low-income homes to experience less predictable daily routines and more residential moves than children in higher income homes. Money provides an opportunity to purchase shelter in less hazardous neighborhoods. Neighborhoods with large proportions of low-income residents are characterized by more violence and gang activity, lower quality neighborhood schools, and more exposure to environmental toxins such as lead.

Parents themselves may be influenced by low income such that their lives are more stressful, conflictual and unpredictable (Conger & Elder, 1994; McLoyd, 1990). Economic instability is also associated with marital conflict, which may have a negative influence on children's experiences (Gordon, Osborne, & Conger, 1997). Parents' emotional health may be compromised, resulting in more depressive, irritable, or volatile moods. Stressful lives and less positive emotional health may themselves influence the day-to-day interactions between parents and children. So, for example, low-income parents may exhibit more inconsistent or harsh behavior with their children, or they may be less emotionally available to their children.

Some work by Susan Mayer argues against the causal role of income (Mayer, 1997). Indeed as is often the case for measures of family background, there is substantial selectivity into being low income (Driscoll & Moore, 1996), and risk factors tend to co-occur. However, a substantial body of research suggests that poverty has both short and long-term effects on children's development, particularly deep and sustained poverty (Duncan & Brooks-Gunn, 1997). In addition, income volatility has been found to impair children's development and adjustment to school. Duncan (1991) has found that many households with children under age five experience extreme ups and downs in the amount of money available to the family, especially as a result of divorce or remarriage. Over a quarter of all children under age five, and more than a third of black children, lived in households in which the ratio of income-to-needs dropped by more than half at least once during a ten-year period. Associations have been found between fluctuations in family income levels and outcomes for children. Such fluctuations create uncertainty about resources. Families may overspend when income is at higher levels, which may compound the difficulty of getting by on income that is low overall. Wu (1996) found support for the idea that fluctuations in income increased the likelihood of a woman experiencing a premarital birth regardless of level of income. He also found some indication that declining income had a detrimental effect that went beyond that of just having a low income. Moore, Morrison, Zaslow, and Glei (1994) found associations between fluctuating in and out of poverty and welfare, and lower scores on a measure of the home environment. These fluctuations were also found to be associated with lower reading scores, lower math scores, and a greater number of reported behavior problems among children ages 7 to 12 years. Clearly, income is not a stable background characteristic but rather a dynamic force. The consequences for children of changes in income levels merit further scrutiny.

Child Support from Absent Parent. Financial support, in the form of child support payments from nonresident fathers, is especially important to the financial well-being of children in low-income, female-headed families (Garfinkel & McLanahan, 1994; Marsiglio, 1995; Nord & Zill, 1996a; 1996b). Levels of child support are related to fathers' legal relationships with their children, with the most consistent payment levels from fathers with joint custody, followed by fathers with visitation rights (Marsiglio, 1995). Child support is positively related to children's well-being, specifically on their cognitive achievement and educational attainment. In addition to financially supporting the child through child support payments, nonresidential fathers may provide in-kind support for their children, in the form of food, diapers, and clothing (Hardy, Duggan, Masnyk, & Pearson, 1989; Sullivan, 1993). Argys, Peters, Brooks-Gunn, and Smith (1996) found that voluntarily reached, cooperative child support agreements are associated with more positive outcomes among children than court-ordered child support agreements. Thus, it is important to measure both the type of custody arrangements and type of child support agreements between parents.

In a study of children of welfare mothers, Greene and Moore (1996) examined three measures of nonresidential father involvement, including father-child visitation, formal child support payments, and informal child support (including both financial and material assistance). They found that while formal child support levels were low in this population (17%), a larger proportion (42%) provided informal child support, and 67 percent had visited at least once in the last year. They found that both monetary and material contributions from the father were associated with positive emotional and behavioral outcomes among children. In addition, informal support (but not formal child support) was associated with higher scores on a measure of the child's home environment. However, Greene and Moore (1996) did not show any effects of father-child visitation on children's well-being.

Argys et al. (1996) used NLSY data to examine the effects of child support payments and awards on child outcomes for black and white children, ages 5-8. They examined samples of children who were eligible for support because their parents were never married or because of a marital disruption. Among the nonmarital sample, they found that receipt of child support was associated with increases in cognitive scores among white children, but not among black children. In contrast, in the marital disruption sample, child support was associated with positive cognitive outcomes among black, but not white, children.

1g. Public Assistance. Poverty and welfare receipt are higher among families with young children (National Center for Children in Poverty, 1996). Receipt of AFDC benefits, particularly if receipt is long-term, reflects a high level of economic deprivation and generally low human capital on the part of the mother (Bane & Ellwood, 1983; Driscoll & Moore, 1996; Zill, Moore, Nord, Stief & Coiro, 1991). McLoyd and Wilson (1991) found that poor single mothers were substantially more likely to be depressed and to provide a non-stimulating environment to their children, age ten to seventeen. Subsequently, children of welfare families demonstrate poorer outcomes across a variety of domains, compared to more advantaged children (Moore, Krysan, Nord, & Peterson, 1991). On the other hand, net of AFDC status and income, the receipt of associated benefits such as food stamps, WIC, and Medicaid should have positive implications for children's physical health. Further, living in public housing probably reflects a very disadvantaged neighborhood environment.

Another question to be considered is how the pattern of welfare receipt, over time, affects children's adjustment to and progress through school. For many children, poverty is not a persistent fact of life but a temporary event--one out of three children experiences poverty for a single year (Duncan, 1991). In analyzing patterns of poverty among children under age four for the subsequent 15 years, Duncan and Rodgers (1988) found that black children lived in poverty for an average of 5.5 years, while non-black children lived in poverty 0.9 years on average. The duration of poverty has been found to have a powerful effect on both cognitive development and behavior among children under age five (Duncan, Brooks-Gunn, & Klebanov, 1994; Moore, Morrison, Coiro, & Blumenthal, 1994).

2. FAMILY ORGANIZATION, COMPOSITION, HISTORY/TURBULENCE

Family structure affects the economic, social and psychological resources available to the family for child rearing purposes. The family context that a child lives in can be extremely fluid, especially over the course of early childhood. At the same time, family circumstances at the time of a child's birth and during infancy can have long lasting effects. It should also be remembered that children also have a great influence on their parents, and that family circumstances change in response to children's needs.

2a. Household Composition. Single-mother families are not only more likely to be poor (Garfinkel & McLanahan, 1986), but also to be persistently poor (Bane & Ellwood, 1983). Research indicates that a wide range of outcomes for children under age 18, including academic performance, are more optimal in families comprising two biological parents who interact with minimal conflict (Dawson, 1991; McLanahan & Sandefur, 1994; Morrison & Cherlin, 1992; Peterson & Zill, 1986). In a study of Baltimore children in the early primary grades, Thompson and her colleagues found that household composition affected student grades and conformity to the student role (Thompson, Entwisle, Alexander, & Sundius, 1992). Students with single mothers, especially black students, received lower grades than did students in married couple households, although the presence of another adult dampened the impact of father absence.

Looking at nonmarital births in particular, Aquilino (1996) found that children of unmarried mothers experienced a variety of living arrangements and household transitions. Of children born to an unmarried mother, those who lived exclusively in a single parent household were particularly likely to have lower educational attainment. Children born to an unmarried mother are also considerably less likely to receive child support from their father (Hanson, Garfinkel, McLanahan, & Miller, 1996). Long-term separation from the mother has been found in some research to be associated with poorer outcomes for children, and living apart from both biological parents is a particularly strong correlate of negative outcomes (Moore, Nord & Peterson, 1989; National Commission on Children, 1991a).

Children's experiences living with another adult in addition to their mother, for example, their father or grandmother, have been found to have positive effects on development (Baldwin & Cain, 1981). Adult household members, particularly relatives, may provide assistance with child care and other forms of social support (Ellison, 1990). If a household member is a father-figure to the child, he can serve as a male role model in addition to contributing economically to the child's needs. Results on the impact of living with grandparents for the children of unmarried mothers have been mixed. Some studies have found that children raised by their grandparents alone had lower school achievement while others found that when grandparents were present in the household in addition to the mother, they provided a stabilizing influence (Aquilino, 1996). Documentation about the sheer number and ages of people living in the household is important, especially if there is overcrowding, because the total number of people can affect the child's well-being and health. In addition, information on the number of biological children living outside of the household (e.g., in foster care or at another relative's house) would shed some light on family organization beyond that gathered from household composition data.

2b. Marital and Cohabitation Status/History. Children of parents who experience a marital separation or divorce typically show less positive development than those whose parents live together. Separation and divorce have been linked to emotional distress (Chase-Lansdale & Hetherington, 1990; Furstenberg, 1990), declines in school achievement, and increases in problem behaviors in school (McLanahan & Sandefur, 1994). Differences between children living in single-parent households and other children with regard to educational disadvantage and the chances of later becoming a teen mother or single parent are only partly explained by differences in income. Even at equal levels of income, children living in single-parent households are likely to experience more negative outcomes in these areas (Hogan & Kitagawa, 1985; Krein & Beller, 1988; McLanahan, 1985, 1988; McLanahan & Sandefur, 1994).

2c. Child's History of Living Arrangements. A number of studies have shown that family turbulence--for example, changing schools, residence, family structure, child custody arrangements, or even child care arrangements--has a negative influence on children's outcomes (Haurin, 1992; Howes & Stewart, 1987; Moore, Zaslow, Coiro, Miller, & Magenheim, 1995a; Peterson & Zill, 1986; Wu, 1996). Turbulence involves the experience of multiple changes in life circumstances. Turbulence during childhood in terms of family structure and living arrangements, family relocation, schools attended, child care, and income level, has been shown to be associated with a number of negative outcomes for children and young adults. Changes in household composition or living arrangements have implications for child well-being. First, changes in household status have economic consequences for children. One study estimated that nonblack children who lived in a single parent household could be expected to spend an average of 3.2 years in poverty by the time they reached age 15, in contrast to 0.5 years on average for those in a two-parent household. The comparable figures for black children were found to be 3.0 years for those in a two-parent household and 7.3 years (or about half their childhood) for those in a one-parent household (Duncan & Rodgers, 1988).

Second, changes in household status and living arrangements have behavioral and emotional consequences for children. Children who do not live with their parents have a much higher likelihood of feeling sad or blue than any other group (National Commission on Children, 1991b). Additionally, children who are placed in the care of a local authority experience a heightened prevalence of psychiatric disorders (Rutter, 1979). The experience of multiple transitions in family situations during childhood is also linked to lower educational attainment (Aquilino, 1996). Given that lower educational attainment decreases earning potential throughout a person's life, multiple transitions in living arrangements during childhood may have long-lasting implications. The frequency of moves during childhood has been found to be related to a number of school-related outcomes. For example, a greater number of moves is associated with an increase in the probability of repeating a grade and in behavioral problems (Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993), and lower levels of academic achievement (Ingersoll, Scamman, & Eckerling, 1989; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Ingersoll et al. (1989) found the most negative effects of mobility when moves occurred during the early grades, but these researchers did find that mobility was linked to lower levels of achievement at all grade levels.

Changes in one sphere of a child's life are often linked with changes in another sphere. When parents divorce, the child's household is likely to experience a loss of income, which in turn may lead to moving and a change in schools or day care arrangements. Simmons et al. (1987) found that multiple changes occurring in a child's life (in terms of school attended, family living situation, and moving) predicted a reduction in participation in extracurricular activities and a greater risk of decline in school grades. This finding suggests that more attention should be paid to instability occurring across multiple areas of a child's life. Turbulence may have more serious implications for children when it is generalized. Studying instability across multiple areas of a child's life also opens up the possibility of studying offsetting influences: the possibility that stability in one or more key areas may offset instability in other areas.

2d. Parents' Childbearing History. There are several reasons for collecting information on parents' childbearing history. One of the most critical variables related to children's well-being is the age of their parents at the time of their first birth. Children of adolescent parents are more likely to suffer poor health, to have slower progress in school, and to have behavioral problems (Hofferth, 1987). Several studies document that children of teenage mothers have lower educational attainment (Furstenberg, Brooks-Gunn & Morgan, 1987; Hofferth, 1987; Moore, Morrison, & Greene, 1997; Moore & Snyder, 1991; Moore, Zaslow, Coiro, Miller & Magenheim, 1995b); lower cognitive attainment from infancy through adolescence (Baldwin & Cain, 1981; Manlove, 1993); lower average levels of academic achievement; and higher average delinquency ratings than children of later childbearers (Belmont, Cohen, Dryfoos, Stein, & Zayac, 1981; Broman, 1981; Maynard, 1997). Maternal age at first birth is also linked to higher levels of behavioral problems among children (Furstenberg et al., 1987).

Early childbearing is associated with poorer outcomes for children for many reasons. More than 80 percent of pregnancies to teen mothers were unplanned, which is related to poorer health status and later or no prenatal care (Brown & Eisenberg, 1995). In addition, those teens who become mothers tend to be educationally and cognitively disadvantaged even before they become mothers (Upchurch, 1993; Moore & Snyder, 1991). Younger mothers also have larger families (Moore et al., 1993) and are more likely to be single parents at delivery (Ventura et al., 1996) which reduces their longer-term prospects for marriage as well (Bennett, Bloom, & Miller, 1995). While some researchers find that background factors entirely explain the negative outcomes associated with teen parenthood for the parents themselves (Hotz, McElroy, & Sanders, 1997), most researchers find that background factors account for the majority but not all of these negative outcomes (Hoffman, Foster, & Furstenberg, 1993; Maynard, 1997; Moore et al., 1993). However, because of the difficulties faced by teen parents, the expected outcomes for their children are relatively poor.

Size of the family is also strongly and negatively associated with child outcomes. Number of siblings is a well-documented predictor of children's cognitive and educational status (Blake, 1989a). Gottfried and Gottfried (1984) found that children between the ages of one and four from smaller families scored higher on standardized tests of ability and had more favorably rated home environments, as measured by the HOME scale. Also, an extensive literature documents that women with larger numbers of children and younger children are less likely to be in the labor force (Moore, Spain & Bianchi, 1984) and more likely to be on welfare (Zill, Moore, Nord, Stief, & Coiro, 1991).

Early and non-marital childbearing and large numbers of children are strongly related to background disadvantages; however, when studies take account of background differences, important differences remain that affect children's development (Blake, 1981, 1989b; Maynard, 1997). Birth order within families is also related to children's development net of family size. Moreover, close child spacing is related to poorer infant health (Spratley & Taffel, 1981).

Use of fertility drugs signals a strong and clear intent to have children, while numerous miscarriages may indicate important maternal health problems that could carry over to live-born children.

2e. Circumstances of Conception, Pregnancy, and Delivery. Unintended pregnancy has been shown to be associated with inadequate prenatal care, a greater tendency for mothers to take behavioral risks during pregnancy, low birth weight, a lesser likelihood of obtaining immunizations in early childhood, infant mortality, and poor child health. It has also been found to be associated with such developmental outcomes as fearfulness and lower levels of positive affect for children under the age of two, with lower scores on verbal development tests for pre-school children, and with higher levels of abuse and neglect. Analyses of the National Survey of Family Growth indicate that mothers with unwanted births spend less of their leisure time with their children and more often spank or slap their children (Barber, et al., 1997).

For parents, consequences of unintended pregnancy include a higher risk of marital failure and increased maternal depression both during and after pregnancy (Baydar & Grady, 1993; Brown & Eisenberg, 1995; Carnegie Corporation of New York, 1994). The intendedness of fatherhood, as well as the stability of the partnership (either cohabitation or marriage) influences patterns of father involvement and engagement, especially among inner city fathers with few economic resources (Furstenberg, 1995). Intendedness of fatherhood may also be related to whether a nonresidential father pays child support (Working Group on Male Fertility and Family Formation, 1997). Ethnographic research has shown that men in low income neighborhoods may sire children to prove their sexual potency or to gain status with their peers (Anderson, 1989). Thus, information about the intendedness of a birth from the father's perspective would provide information about the context of parenting and how that context affects both children's development and their public dependency.

In addition to circumstances of conception, circumstances of pregnancy and delivery can have lasting effects on children's growth and development. For example, pre-pregnancy height and weight of the mother are useful indicators of a child's growth in utero. Pre-pregnancy maternal height and weight are also potential risk factors for adverse pregnancy outcomes. In addition, early medical complications are often associated with the mode of delivery (vaginal, emergency or voluntary caesarian, aided or unaided) and the number of days that the mother and child stay in the hospital after the birth (especially if the child's stay in the hospital is longer than that of the mother).

2f. Child's Health Status at Birth

Birth Weight. Infants who are born at low birth weight (less than 5½ pounds) are known to be at significantly greater risk of congenital abnormalities, with later developmental and behavioral problems, and with poorer educational achievement and family functioning than those born at higher birth weights (Frisbie, Forbes, & Pullum, 1996; McCormick, 1989). They are also much more likely to suffer from chronic conditions (National Commission on Children, 1991a). Using data from the National Health Interview Survey, Child Health Supplement, McCormick, Gortmaker, and Sobol (1990) showed that very low birth weight is related to measures of school failure, including grade repetition and special education, as well as hyperactivity, even after controlling for sociodemographic factors. Similarly, researchers using data from the National Collaborative Perinatal Project found that low birth weight is related to achievement scores (Buka, Newman, & Gortmaker, 1990).

There are two categories of infants born with low birth weight. In some cases birth weight is low because the infant was born three or more weeks before the expected 38 weeks gestational age. In other cases infants' birthweight is at the low end (bottom 10%) of the normal distribution of birth weights for infants born at the same gestational age--whether premature or full-term. These infants are referred to as being small for gestational age (SGA). Both conditions may have implications for later cognitive and social development.

In early infancy, SGA infants tend to have poor muscle tone, and they appear limp when held. They tend to be difficult to arouse and they show poor visual orientation to stimuli (Als, Tronick, Adamson, & Brazelton, 1976). Deficits in perceptual and cognitive performance have been found later in infancy and preschool as well. At seven months, SGA infants have been found to have poorer recognition memory than normal weight infants (Gotlieb, Baisini, & Bray, 1988). In preschool, SGA children may continue to demonstrate lower IQ test performance. In one study, Dowling and Bendell (1988) compared SGA premature infants with premature infants whose weight was not low for their gestational age. They found that the SGA premature children had lower verbal IQ scores than did the other children.

SGA birth may put a child at risk of future cognitive and social problems for a number of reasons. SGA birth is caused by retardation of fetal growth, which in turn may be caused by a number of factors. These include chromosomal abnormalities, poor maternal nutrition, infections, and maternal substance abuse. These factors may have direct, continuing effects in and of themselves. In addition, environmental conditions such as maternal substance abuse may persist after birth, increasing the possibility of long-lasting negative effects. Finally, the nonresponsive, limp characteristics of SGA infants may make it more difficult for adult caretakers to establish strong positive emotional bonds with them, thus increasing the risk of reduced verbal and physical stimulation and poor attachment relationships.

Prematurity. Premature infants typically are born at low birth weights as well--generally below 5.5 pounds. Premature infants' cognitive and social development may be at risk for a number of reasons. Physical immaturity can lead to serious respiratory and other problems that may compromise development. Premature infants' visual-motor development is depressed relative to full-term infants, even after adjusting for gestational age (Klein, Hack, Gallagher, & Fanaroff, 1985; Saigal, Szatmari, Rosenbaum, Campbell, & King, 1990). Their behavior is generally less organized than is the behavior of full-term infants (Als, Duffy, & McAnulty, 1988). They tend to sleep more than full-term infants, and their patterns of sleeping and waking are more irregular, making them less predictable. They also fuss and cry more than do full-term infants, and their cries are higher in pitch and less rhythmic, making them more disturbing to listeners (Friedman, Zahn-Waxler, & Radke-Yarrow, 1982; Frodi, Lamb, Leavitt, & Donovan, 1978).

In addition to the potential direct neurobiological effects of prematurity on later cognitive and social development, characteristics of premature infants may put them at increased risk of receiving poor care. Prematurity may interfere with the ability of the parent to foster a secure infant-parent attachment relationship. In addition, premature children have been found to be abused at a rate that is higher than that for full-term infants (Kopp, 1983).

Finally, some studies have found prematurity to be associated with reduced mastery motivation in the infant-toddler period, relative to full-term infants and toddlers (Harmon & Culpe, 1981; Hauser-Cram, 1996). These differences may be a result both of neurobiological differences and differences in qualitative aspects of parent-child relationships.

Apgar. The Apgar is a test, initially developed in 1953 by Dr. Virginia Apgar (Apgar, 1953), that assesses the physiological status of the newborn infant. The test covers five areas of functioning: respiration, heart rate, muscle tone, skin color, and response to a mildly painful stimulus. The newborn receives a score of 2 for each area in which functioning is considered optimal, a score of 1 if functioning is less than optimal, and a score of 0 if functioning is very poor. Criteria for different scores are objective.

For example, a score of 2 for heart rate is given for a rate of 100-140 beats per minute, a 1 is given for a rate less than 100, and a 0 is given if no heartbeat is detectable.

The Apgar is a screening test, designed to provide an immediate initial evaluation of whether an infant requires special monitoring or procedures. Newborns with very low Apgar scores are at increased risk for sudden infant death syndrome (SIDS). Positive correlations have been found between Apgar scores and intellectual functioning in infancy and early childhood, although research findings have been mixed (Francis, Self, & Horowitz, 1987).

Head Circumference. Head growth occurs throughout the first year, achieving nearly adult size by about 12 months. However, normal growth patterns may be affected by poor environmental conditions both during pregnancy and post-partum. Head size may be a better indicator of the appropriate percentile in states of malnutrition. Obtaining a measurement of head circumference at birth or within the first six months of life might be helpful in assessing growth failure in utero (intrauterine growth restriction) and early infancy (failure to thrive). In fact, an early assessment of head circumference might provide more information on potential poor development than developmental testing, largely because the developmental repertoire of infants within the first six months of life is extremely limited.

Well-baby Check-up. Infants' health status after leaving the hospital continues to be monitored through well-baby check-ups. Some preliminary, unpublished results from analyses conducted on data from Healthy Start and the National Maternal Infant Health Survey indicate that receiving information about well-child care is related to maternal health-related behaviors. Specifically, mothers who did not report having heard about well-child care after pregnancy were less likely to have initiated well-child care (M. McCormick, personal communication, September 19, 1997).

2g. Parental Psychological Well-being

Depressive Symptomatology. Shonkoff (1992) includes family mental health as one aspect of family health that is relevant to child outcomes. Depression is defined as a negative mood state so extreme that it interferes with daily functioning and productive activity. In general, the highest rates of depression are found among people with low incomes, among women, parents with young children, young adults, unmarried people, the poorly educated, and the unemployed (Eaton & Kessler, 1981; Hall, Gurley, Sachs, & Kryscio, 1991; Hall, Williams, & Greenberg, 1985; Klerman & Weissman, 1989; Orr, James, Burns, & Thompson, 1989). Consequently, single mothers on AFDC with young children have been found to be at especially high risk for developing depressive symptoms. In accordance with previous studies of low income mothers (Hall et al., 1991), 42 percent of AFDC mothers in the JOBS Descriptive Study reported high levels of depressive symptoms (Moore et al., 1995a). Similarly, a longitudinal study of young women on AFDC who had given birth as teenagers found that about half of the program applicants were at risk of clinical depression at baseline (Quint, Polit, Bos, & Cave, 1994).

In the Washington State Family Income Study (Weeks et al., 1990), the public assistance sample was found to have a greater percentage of mothers who reported high levels of depression than control groups. Longer duration on welfare was associated with more depression, while women in the study who were enrolled in school or a training program, and those with jobs, were less likely to be depressed. Other studies have also found that employed women tend to have better psychological health than nonemployed women (Kraus & Markides, 1985; Ross, Mirowsky & Goldstein, 1990).

High levels of depression and stress interfere with effective functioning in adult roles, particularly with regard to parenting (e.g., Cooley & Unger, 1991; Lyons-Ruth, Connell, & Grunebaum, 1990; Richters & Pellegrini, 1989; Simons, Beaman, Conger, & Chao, 1993). Specifically, parents who are depressed or highly stressed are less likely to provide emotional support to their children and more likely to employ harsh disciplinary practices (Puckering, 1989; Richters & Pellegrini, 1989; Moore, Zaslow, Coiro, Miller & Magenheim, 1995b). In their interactions with preschool children, depressed mothers are more critical, less responsive, and less active (McLoyd & Wilson, 1991). Similarly, research by Cox, Puckering, Pound, and Mills (1987) found that maternal depressive symptoms predict parenting that is more hostile and less responsive than parenting by nondepressed mothers. In general, maternal emotional distress is associated with a lower frequency of positive behavior toward the child and a higher frequency of negative behavior.

Such parenting styles are consistently associated with poorer child outcomes (see Maccoby & Martin, 1983, for a comprehensive review of this literature). That is, in addition to the negative ramifications of depression for mothers themselves, a variety of child development studies have found that children of depressed parents display higher levels of both externalizing (e.g., aggressive) and internalizing (e.g., anxious, depressed) behavior problems, often have deficits in social and academic competence, and are in poorer physical health than children of non-depressed parents (Downey & Coyne, 1990). Parents who are depressed or highly stressed are less likely to provide emotional support and more likely to employ harsh disciplinary practices (Puckering, 1989; Moore et al., 1995b). Maternal emotional distress is associated with a lower frequency of positive behavior toward the child, and a higher frequency of negative behavior. In interactions with preschool children, depressed mothers are more critical, less responsive, and less active and spontaneous (McLoyd & Wilson, 1991). Furthermore, youth with mothers who receive psychological therapy have been shown to have a higher likelihood of developing depression, illegal drug use, delinquency, and high school dropout net of control variables (Moore et al., 1994).

Stress or Anxiety Related to the New Parenting Role. The transition to parenthood involves adjustment to a new life role (Goldstein, Diener, & Mangelsdorf, 1996). The most successful transitions usually involve a sense of confidence and self-efficacy in the new role as a parent. A mother's confidence that she can successfully manage her child is associated with such child behaviors as compliance and negativity, as well as the overall quality of the mother-child relationship, and may be related to attachment (Weinfield, Egeland, & Ogawa, forthcoming).

Parenting Aggravation and Role Stress. Aspects of being a working parent, such as concerns over job security, conflict with co-workers or supervisors, and scheduling conflicts between work requirements and child care may well contribute to a subjective sense of stress that diminishes effective parenting, leading to less favorable outcomes for children. Financial stress and strain, such as worries about having enough money and problems paying bills, may account for part of the well-established association between family income and child developmental outcomes. Furthermore, greater parenting aggravation has been found to be associated with poorer child development outcomes. For example, in the control group of the JOBS Descriptive Study, greater aggravation and stress in parenting, measured when children were between 3 and 5 years of age, was strongly associated with the reported number of child behavior problems two years later.

Locus of Control. In general, individuals who have an external locus of control tend to feel at the mercy of circumstances and environmental events, whereas those with an internal locus of control are more likely to feel in control of their own destinies. A greater sense of self-efficacy and feelings of personal control on the part of parents may have beneficial consequences for children, especially if these feelings generalize to confidence in the parenting role. Stevens (1988) found that a more internal locus of control was the only significant predictor of whether low-income, African American mothers provided stimulating environments for their children.

Stressful Life Events. Stress due to negative life circumstances and events has been found to be related to poorer caregiving behavior (Pianta, Egeland, & Sroufe, 1990) and higher levels of depressive symptoms (Hall et al., 1985). Families under strain from multiple difficulties are likely to be less successful parents since parental stress has been found to be associated with socioemotional, behavioral, and cognitive difficulties in children (Pianta et al., 1990).

2h. Parental Health and Health-Related Risk Behaviors. Prenatal care has a profound association with the health of both mother and child. Early medical care, even before conception, provides training on proper nutrition and on eliminating risk behaviors such as smoking and alcohol consumption before they present a risk to the fetus. Besides providing information about ways to assure a healthy pregnancy, medical care during the prenatal period allows for the treatment for conditions which may affect the birth and the child's health. Women who do not receive routine prenatal care are about three times as likely to deliver low birth weight babies. Genetic disorders and birth defects, which may be detected and treated during the prenatal period, may lead to chronic poor health throughout life. Moreover, a lack of prenatal care is a strong correlate of subsequent abuse and neglect. Late onset of prenatal care is closely associated with unintended pregnancies (Carnegie Corporation of New York, 1994; National Commission on Children, 1991a).

Postpartum care is also important. The postpartum check-up and birth control use after pregnancy are both related to spacing of pregnancies. Appropriate spacing of pregnancy and limits in childbearing have implications for the mother's ability to provide the child with attention, as well as the outcome of subsequent pregnancies (e.g., future intended vs. unintended pregnancies) (Blake, 1981, 1989a; Spratley & Taffel, 1981).

Parents with alcohol and drug problems represent a sub-group with a particularly poor prognosis for appropriate child rearing (Deren, 1986; Moore et al., 1991; Newcomb & Bentler, 1989). Poverty is considered to be associated with less prenatal care, poorer maternal health, tobacco, alcohol and drug use during pregnancy, and an increased likelihood of toxins in the immediate environment (e.g., lead paint) (Klerman, 1991). In turn, each of these health risks is associated with negative outcomes among children, including diminished cognitive functioning, school failure, hyperactivity and inattention, deficits in speech and auditory processing, and behavior disorders (Newman & Buka, 1990).

A recent longitudinal study has shown that prenatal exposure to alcohol across the full spectrum of amount of use was associated with a significant dose-response relationship between exposure and children's school performance at age 11 (Dion, 1997). Prenatal drinking led to several classroom behavioral problems, including attentional, activity, and information-processing difficulties (Olson, Sampson, Barr, Streissguth, & Bookstein, 1992). Lower cognitive functioning (including less advanced verbal, reading, and mathematical skills) has been associated with cigarette smoking during pregnancy (Rush & Callahan, 1989). The use of other drugs, such as cocaine and crack during pregnancy, is related to lower birth weight and gestational age (Chasnoff, Griffin, MacGregor, Dirkes, & Burns, 1989; Cherukuri, Minkoff, Feldman, Parekh, & Glass, 1988).

3. FAMILY PROCESSES

Characteristic patterns of family interaction and activity influence the cognitive and social development of young children in numerous ways. First, infant-parent interaction patterns directly influence developmental outcomes. Second, families actively structure the infant's social and physical worlds, thus providing opportunities for exploration and for exposure to stimuli. Third, children are influenced not only by their direct relationships, but by the nature of other family relationships to which they are exposed. Fourth, infant and child development is influenced by the larger society and its impact on the family. Thus, issues of culture, religion, ethnicity and race become important in forming a complete picture of the early influences on cognitive and social development. As a child develops, and family patterns change, the relative strength of these influences and the interactions between them inevitably change as well.

Literacy development is one aspect of a child's brain development which has recently received renewed policy attention (Begley, 1997). An extensive research literature on literacy development has established a strong connection between parent-child interaction and children's reading skills (Powell, 1992). This literature shows that children's reading skills are positively related to a combination of verbal and nonverbal interaction when parents read to their children. Early literacy development is also related to other family social interactions that are not necessarily intended to foster language development (e.g., shopping), especially among low-income samples (Teale, 1984). Parents also provide several indirect contributions to their children's literacy development: 1) through access to reading and writing materials in the home and visits to the library; 2) through parents' own reading habits; and 3) through parental enforcement of television viewing rules for their young children (Teale, 1984).

3a. Cognitive Stimulation: Activities

An environment that is stimulus-rich without being overwhelming and chaotic is important for healthy cognitive and emotional development. Numerous studies of the effects of the environment on infant development have utilized the Home Observation for Measurement of the Environment (HOME) scale (Caldwell & Bradley, 1979). This measure involves multiple aspects of the environment, including both physical and social, and assesses the extent to which the environment provides positive, age-appropriate stimulation for the infant. High levels of such stimulation have been found to be positively associated with social and mental development (Bakeman & Brown, 1980), including measures of cognitive development and IQ in preschool and later (Bradley & Caldwell, 1976a, 1976b, 1980, 1984a; Bradley, Caldwell, & Elardo, 1979; Bradley et al., 1989; Lozoff, Park, Radan, & Wolf, 1995), and school achievement (van Doorminck, Caldwell, Wright, & Frankenberg, 1981). Recent research has suggested that such stimulation in very early life may have implications for brain development and cognitive potential (National Commission on Children, 1991a).

Parental Involvement. According to Lamb (1986) there are three components of parental involvement, including: 1) interaction, in which the parent is actively engaged with the child; 2) parental accessibility to the child, including activities that do not involve direct interaction such as spending time in separate rooms; and 3) parental responsibility for the child's care and welfare, such as scheduling doctors' visits, clothing the child, and making sure meals are ready. Research studies tend to focus on interaction and responsibility (Working Group on Conceptualizing Male Parenting, 1997). While mothers are much more likely than fathers to have direct interactions with their children and to take responsibility for their child's well-being, a working group on conceptualizing male parenting (Working Group on

Conceptualizing Male Parenting, 1997) suggests that fathers may have higher levels of parental accessibility. Thus all three types of parental involvement should be included in a survey of children.

The specific issue of fatherhood has been relatively neglected by the research community. However, several recent studies have begun to examine the specific influence of father involvement on child outcomes. Children of more involved fathers have been shown to develop more balanced gender expectations and have more positive cognitive and socioemotional outcomes than other children (Coltrane, 1995). In two-parent families with an unemployed mother, fathers on average spend about 20 to 25 percent as much time as mothers in direct interaction with the child, and about a third as much time being accessible to the child. (Lamb, Pleck, Charnov, & Levine, 1987; Pleck, 1983, 1997). Additionally in two-parent families where both parents are employed full-time, paternal interaction and accessibility are substantially higher than in families with an unemployed mother (Lamb et al., 1987; Pleck, 1983, 1997). Time diaries have also shown that the amount of time fathers spend with their children varies with socioeconomic status (lower SES fathers spend more time with their children than higher SES fathers), age of the child (the younger the child, the more time the father spends with the child), and gender (fathers spend less time with girls than with boys) (Lamb, 1986; Working Group on Conceptualizing Male Parenting, 1997).

Black, Dubowitz, and Starr (1996) recently presented preliminary findings that suggest positive effects of father involvement on child outcomes. Their sample included low-income, urban African American fathers (or father figures) and their 3-year-old children. After controlling for maternal age and education, they found that paternal parenting satisfaction, fathers' employment, and their level of nurturance (as measured in videotaped play observation) was associated with better cognitive and language development among children. They also found that homes were more child-centered when fathers reside in the home with their children.

Frequency of verbal interaction between parent and child. The amount of verbal interaction that infants and toddlers have with their parents has been shown to influence language development, including language production and reading ability, as well as other academic skills such as mathematics in the school years (e.g., Bradley & Caldwell, 1980, 1984b; Bradley et al., 1989). Verbal interactions include singing, playing games, talking, reading books, and telling stories. Clarke-Stewart (1980) found that mother-infant verbal interaction and verbally-mediated toy play were associated with cognitive development.

Use of structured educational materials. The value of using structured educational materials, such as flash cards, with infants and toddlers is controversial. Parents who stress formal educational activities at an early age may put undue performance pressure on their infants and young children, potentially diminishing children's intrinsic motivation to learn. Further, child development experts emphasize that infant cognitive development may be most strongly affected by the infant's own actions, and the reactions they receive from the environment. On the other hand, if structured educational materials are used by parents in the context of positive verbal interactions with their infants, without undue pressure and without diminishing the child's opportunities for independent exploration, they may enhance cognitive development.

Researchers have demonstrated the importance of a physical environment that is safe, stimulating, and responsive to young children's needs. In particular, an environment that offers a variety of stimulating experiences, including those provided through the use of books, toys, and games, is more developmentally enriching and may buffer the potentially negative effects of other environmental or biological risks (Bradley et al., 1979).

Shared activities. In addition to verbal interactions, parents clearly differ in the extent to which they engage in shared activities with their infants and toddlers, and the extent to which they include infants in family activities.

One important form of shared activity is play. Play may involve the use of structured materials as described above, or it may be more unstructured. In the United States, fathers spend the majority of their time with their infants and toddlers in play (see Parke, 1996). Clarke-Stewart (1980) found that fathers who were able to keep their infants interested in games such as peek-a-boo, ball toss, and bouncing had more cognitively advanced children, as assessed with the Bayley Scales of Infant Development. Interestingly, this is in contrast to the greater effect of verbal interaction with mothers (described earlier).

Another form of shared activity that can provide important variety in cognitive stimulation for infants and toddlers involves taking them on excursions away from home. In particular, the frequency with which parents take their young children to parks and playgrounds may be particularly important for early cognitive and social development. Such outings can provide young children with opportunities for exploration, for physical exercise, and for social interaction. Among the separate subscales of the HOME assessment that have been found to be associated with later IQ is "Organization of the Environment"--a subscale that includes questions about taking trips to the grocery store and other away-from-home activities (Lozoff et al., 1995).

Arranging play groups or other interaction with peers and adults. In recent years, researchers and theorists have begun to discuss the importance of the managerial role that parents play in arranging their children's social experiences, and the implications that individual differences may have on subsequent social development (Parke et al., 1989).

Television, radio, and video. Considerable research with older children and adults exists concerning the (primarily negative) impact that television viewing has on behavior, attitudes, and academic performance. Little is known about the impact that early exposure to television has on infants and toddlers. Results of previous work on television viewing and children's cognitive and social development suggest that both the amount of exposure to television (and other electronic media) and the types of exposure (e.g., what programs are viewed, what kinds of social interactions accompany television viewing) are important factors to consider.

If a family's television is on for many hours of the day, family social interaction has been found to decrease with potentially negative effects on children's cognitive development. In one study, Belsky (1984) found that, in two-parent families, the only activity that fathers engaged in with their infants more than mothers was watching television. This might suggest that differences across families in the amount of time that television, radio, and videos are on may have a particularly strong impact on father-infant relationships.

In addition to potential negative effects, toddlers' exposure to particular types of programming may have beneficial effects. For example, in experimental studies it has been found that watching television programs with strongly prosocial content (such as "Mister Rogers' Neighborhood") leads to increases in children's prosocial tendencies. These same studies, however, suggest that passively viewing these programs does not affect later behavior. Instead, added role playing and discussion with adults increases the impact of these programs on children.

Parents' time spent reading to self. Teale (1984), in a review of evidence regarding parents' indirect influences on children's literacy skills, reported that parents who read more tend to have children who read at earlier ages. One possible mechanism for this is modeling. Children who observe their mothers and fathers reading to themselves may become more motivated to learn to read, and to actually read themselves, than are children whose parents do not read.

3b. Cognitive Stimulation: Materials

Numerous studies have indicated that an environment that is rich in stimulating materials positively influences cognitive development and subsequent achievement. For example, the number of books in the home, including coloring books, picture books, and story books, has been found to be positively associated with children's literacy (Teale, 1984). Other materials include toys that provide opportunities for muscular activity (e.g., push-pull toys, scooters, play cars), for interesting visual and auditory feedback (e.g., a jack-in-the-box, busy boxes, musical instruments), for exercising eye-hand coordination (e.g., shape sorters, stacking toys, building blocks), for pretend play (e.g., cuddly toys, kitchen sets, dolls or plastic figures), and for creative activity (e.g., paper and crayons). Lozoff and colleagues (1995) found that the subscale of the HOME tapping the presence of appropriate play materials in infancy was the strongest of the six subscales in its association with child IQ at 5 years of age.

3c. Parents' Expectations for the Child's Development

Educational aspirations and expectations for the child. Little is known about the relations between the expectations and aspirations that parents have for their infants and toddlers and their children's subsequent cognitive and social competence. However, educational aspirations and expectations do represent important predictors of later school achievement (Brooks-Gunn, Guo, & Furstenberg, 1993). Parents' expectations for student performance and their ideas about children's ability are powerful predictors of children's ideas about their own academic competence in elementary grades (Entwisle & Baker, 1983; Parsons, Adler, & Kaczala, 1982). Entwisle and Hayduk (1982) found that children whose parents have more positive impressions of their ability perform better than their peers in primary school. Indeed, parental perceptions of their children's ability are more strongly related to children's academic performance in grades five through nine than their actual ability as measured by standardized tests (Parsons et al., 1982). Because parental educational aspirations for their child may be affected by their child's level of development and because educational expectations may change with family experience, it is important to measure aspirations and expectations for the child over time. This will allow for an examination of the stability (as well as the level) of expectations on child outcomes.

Differences in expectations for children's educational achievement are apparent across cultural groups. Okagaki and Sternberg (1993) asked parents of children aged five through eight about child rearing, appropriate teacher practices, and what characterizes an intelligent child; the sample was drawn from American-born parents from two ethnic groups (Anglo-American, Mexican-American) and immigrants from four countries (Cambodia, Mexico, the Philippines, and Vietnam). Immigrant parents rated conforming to external standards over the development of autonomy as important in child rearing; in contrast, American-born parents favored autonomy over conformity. Parents from all groups but Anglo-Americans indicated that motivational and social skills were as important as, or more important than, cognitive skills such as problem-solving and verbal ability as characteristics of an intelligent child.

Further, Okagaki and Sternberg showed that parental beliefs about conformity were correlated with kindergartners', first graders', and second graders' school performance (both teacher-report and standardized tests).

Attitudes about the value and importance of education. Among school-age children, parents' attitudes have been found to be related to school success, but little work has been published regarding infants and toddlers. For example, Rescorla and colleagues (Rescorla, Hyson, Hirsh-Pasek, & Cone, 1990) found that parent attitudes about appropriate skills for preschoolers were highly consonant with the community reputations of their children's schools, with mother's ratings on the importance of academic, arts and athletic skills distinguishing "academic" preschool from non-academic programs. In addition, parental beliefs that emphasize a constructivist or interactional view of child development have been found to be positively associated with child cognitive outcomes at ages three and four (McGillicuddy-DeLisi, 1985) and at ages five and six (Johnson & Martin, 1983).

Knowledge, awareness, and appropriate expectations of the infant and child development. The extent to which parents exhibit an awareness both of their own child's characteristics and of general child development is likely to influence the child's development. Abusive parents have been found to have unreasonably high expectations for their infants' and young children's behavior. It is thought that this may lead to frustrations when children do not live up to these expectations, which in turn promotes abusive behavior in some cases. This may also be one reason why children who are premature or who are developmentally delayed are at increased risk for abuse. Parental knowledge of developmental milestones is associated with positive parenting practices and child outcomes, particularly among families at risk (e.g., Field, Widmayer, Greenberg, & Stoller, 1982; Greenberg & Crnic, 1988; Stern, 1990).

Motivations for involvement. A working group on conceptualizing male parenting (Working Group on Conceptualizing Male Parenting, 1997) recently outlined several types of motivation for fathers (and mothers) to be involved in parenting. These motivations may be associated with levels of involvement of both mothers and fathers. Types of motivation include: 1) socio-biological motivations, in which both parents strive to maximize the survival of their offspring; 2) generativity, in which parents are involved with their children because it is related to healthy adult development; and 3) maturity and status, in which being a parent denotes maturity and is a source of status when partners and children are well provided for and successful. Motivation may also be influenced by commitments to role identities, as well as a belief in the commitment and responsibility that accompanies parenthood.

As noted by the recent working group on conceptualizing male parenting (Working Group on Conceptualizing Male Parenting, 1997), motivation for involvement in parenting may differ based upon which aspect of involvement is being considered. Areas of parental involvement might include communication, teaching, monitoring, thought processes, errands, caregiving, planning, protection, and many others (Palkovitz, 1997). Motivations for involvement fall into three broad categories: individual/personality (such as psychological well-being, construct 2g in the construct grid), interactional context/process (such as family process, domain 3 in the construct grid), and meso-macro contexts (such as cultural ideologies; Palkovitz, 1997).

3d. Discipline

Disciplinary practices (type and frequency). Parents' attitudes and practices regarding discipline vary tremendously, and this variability has been found to be associated with differential outcomes for children. One particularly important difference appears to be the extent to which parents rely on physical punishments such as spanking versus talking and reasoning in disciplinary encounters. A large majority of children in the United States are spanked at some time during childhood (Gil, 1970; Straus & Gelles, 1986). Spanking can be differentiated from other forms of hitting and beating, which may be considered more violent. In one study it was found that preschoolers who were spanked were more aggressive with peers in kindergarten than were children who did not receive any form of physical punishment. Preschoolers whose parents reported hitting or beating them were the most aggressive group of all (Strassberg, Dodge, Pettit, & Bates, 1994).

Another form of physical discipline is timeouts. Generally, timeouts involve isolating the child as much as possible for a brief "cooling off" period following some type of transgression. Although timeouts have not been specifically linked to positive child outcomes, they have been found to be effective when used consistently by parents. Teaching parents to use timeouts rather than spanking or hitting has been found to be an important component of family therapy for children with severe problems with aggression (Patterson & Stouthamer-Loeber, 1984).

Parents' use of discussion and reasoning in discipline encounters appears to facilitate prosocial behavior. Zahn-Waxler and her colleagues (Zahn-Waxler, Radke-Yarrow, & King, 1979) found that, in situations in which a child has injured or upset someone else, maternal use of emotionally-toned explanations was linked to 15- to 29-month-old children's attempts to make reparations and levels of altruistic behavior. Emotionally-toned explanations focus on the child's effect on the other, with an emphasis on how the other individual was hurt, made sad, etc. Interestingly, simple verbal prohibitions, cause-effect explanations without emotional tone, physical restraint and physical punishment each had no association with these very young children's subsequent prosocial behavior.

The use of praise and rewards for good behavior is another dimension of parental discipline practices. Social learning theorists have long suggested that punishment alone is not an effective way of making positive changes in children's behavior. Patterson and Dishion (1988) have found that families of aggressive boys are particularly lacking in their attention to positive behaviors. Social rewards (e.g., smiles, praise) provide information to children about how well they are doing in meeting parental expectations. Thus, the ability of parents to recognize and provide social rewards for good behavior may facilitate a sense of competence in young children (Harter, 1983).

Parental control. There are at least two different dimensions to parental control that may have different implications for children's future cognitive and social competence. The first dimension reflects an orientation toward control vs. autonomy support. This is the extent to which parents attempt to exert control over all aspects of their children's lives, and the extent to which they value obedience to authority. High levels of control, in this sense, are characteristic of authoritarian parenting (Baumrind, 1971, 1973), which has in turn been negatively associated with school-related abilities in childhood (Hess & McDevitt, 1984) and adolescence (Connell & Wellborn, 1991; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987).

The second aspect of control, sometimes referred to as structure (Connell & Wellborn, 1991), refers to the extent to which parents are willing and able to influence their children's environment and activities. For young children, this includes setting and enforcing behavioral rules but in a context of allowing and encouraging exploration of the environment. Baumrind (1967) found that Anglo-American preschool children who were "most competent" in terms of self-control, self-reliance, exploration, and contentment tended to have parents who "balanced high nurturance with high control and high demands with clear communication about what was required of the child" (p. 80)--a style that she termed "authoritative." Authoritative control is in stark contrast to the form of control termed "authoritarian", in which parents use power-assertive techniques in a non-nurturant context. Baumrind (1967) found that children who were discontented, withdrawn, and distrustful tended to have authoritarian parents. Finally, preschool children who were the least self-reliant, least explorative, and demonstrated the worst self-control tended to have parents who were non-controlling, had few maturity demands, and used lax discipline--a style she called "permissive." Interestingly, she also found that authoritarian parenting was more prevalent among middle-class African-American than middle-class white families and that, unlike in the white families, authoritarian parenting in African-American families was associated with independence and assertiveness in young daughters (Baumrind, 1972). This speaks to the importance of examining differences in parenting by racial/ethnic group as well as differences in outcomes for boys versus girls.

3e. Warmth, Physical Affection and Emotional Supportiveness

Among the most consistent findings in child development research is that parental warmth exhibited in the first few years of life is one of the strongest predictors of positive developmental outcomes. Warmth, sensitivity, and nurturance are global constructs that include numerous affective and behavioral components (Carnegie Corporation of New York, 1994; National Commission on Children, 1991a). Supportive parenting is associated with positive child outcomes, even in the presence of extreme socioeconomic disadvantage (Marsiglio, 1995). Sampson and Laub (1994) also suggest that positive parenting provides a buffering effect for children in poverty.

Affection. Affectionate behavior on the part of parents with their infants and toddlers is associated with a number of positive outcomes for children, including the establishment of a secure infant-mother attachment relationship (Ainsworth, Blehar, Waters & Wall, 1978). Cox and Owen (1988) found that fathers who express positive attitudes about their 3-month-old infants were more likely to foster secure infant-father attachments than were other fathers. Insecure/avoidant attachment relationships, in particular, are associated with maternal behavior that is physically rejecting, particularly of infants' comfort-seeking behavior. Children with a history of avoidant attachment relationships have in turn been found to be socially isolated and aggressive with peers in preschool and school settings (Bretherton, 1985).

Warmth. Warm, affectionate behavior towards a child may also make the parent a more powerful model for young children. Studies of prosocial development, in particular, have indicated that children are more likely to try to imitate the behavior of a model who has exhibited warm, nurturant behavior toward them than the behavior of otherwise similar models who have been more matter-of-fact in their interactions (Eisenberg & Mussen, 1989; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983). Zahn-Waxler et al. (1979) found that toddlers of highly nurturant, empathic mothers were more concerned about others' distress and were more empathic than were other toddlers. Paternal empathy and nurturance have also been associated with children's considerateness, helpfulness, and generosity, but these studies have been conducted primarily with school-age children and have been more inconsistent in their findings (Eisenberg & Mussen, 1989).

Presence of positive interaction/lack of negative parenting practices. Positive infant-parent relationships are characterized not only by warm, affectionate behavior, but also by contingent responsiveness on the part of the parent. In other words, sensitive parents seem to comprehend and respond appropriately to infants' and toddlers' signals. Such responsiveness has been found to be important for many aspects of children's development, including the establishment of secure infant-parent attachment relationships (e.g., Ainsworth et al., 1978; Belsky & Isabella, 1988; Egeland & Farber, 1984; Smith & Pederson, 1988), the development of emotion regulation (Tronick, 1989), mastery motivation (Harter,

1983) exploratory competence, and literacy development (Baydar, Brooks-Gunn, & Furstenberg, 1993; van Aken & Riksen-Walraven, 1992).

Negative parenting practices have been found to be associated with poor outcomes for children in both the cognitive and social domains. In addition to harsh discipline practices and over- or under-exertion of child rearing, other forms of parental coercive or negative behavior, including ridicule, high-intensity teasing, and extreme nonresponsiveness (the "silent treatment") have been found to be associated with poor social and cognitive functioning in childhood. Patterson and Dishion (1988) have found all of these parenting patterns to be exhibited in families of aggressive school-age boys, and Hoffman has found the use of love-withdrawal and the silent treatment to be associated with low levels of prosocial behavior. Although not well studied in normative samples with very young children, such negative parenting practices may interfere with the establishment and maintenance of secure infant-parent attachment relationships (Bowlby, 1988) and with the development of perceived competence and mastery motivation (Harter, 1978).

Parents' sensitivity and responsiveness to a child's state. The parent's ability to accurately interpret the infant's social and affective signals has been found to be associated with more positive infant-mother interactions (Stern, Hofer, Haft, & Dore, 1985; Tronick, 1989). One aspect of parental responsiveness that has been examined involves parents' responses to infant crying. A number of studies have found that abusive parents have stronger physiological responses and more negative attitudes expressed on self-report measures, than do other parents or nonparents (e.g., Frodi & Lamb, 1980). Other studies have found that mothers of insecurely attached infants, particularly avoidant infants, are less accepting of an infant's dependent behavior and expressions of negative emotion than are mothers of secure infants (Cassidy, 1994). In contrast, Ainsworth and her colleagues (Ainsworth et al., 1978) found that mothers who responded quickly and consistently to their child's cries during the first three months of life had infants who cried less in the last quarter of the first year.

Closeness with an absent parent. Greene and Moore (1996) suggest that while both informal and formal means of child support by absent fathers are associated with positive child outcomes, they were unable to find a relationship between father visitation and child outcomes. However, many studies suggest that the relationship between an absent parent and his or her child is associated with positive outcomes (Marsiglio, 1995). Moore, Mariner, Morrison, Coiro & Blumenthal (1996) found that the negative effects of divorce were mediated by contact with the absent parent; for boys, they found no significant association between divorce and high school completion or anti-social behavior if the relationship with the absent parent was accounted for.

3f. Structuring of the Home Environment

Parental rules and monitoring. Research studies have found that parental monitoring of television viewing can indirectly influence children's literacy skills (Teale, 1984). Further, parental involvement in children's television viewing through discussion of programs is associated with fewer problem behaviors (Morrison & Glei, 1993). These findings regarding parental involvement in children's television viewing highlight the importance of knowing how often parents watch and discuss this programming with their toddlers.

Restrictiveness vs. autonomy support. Harter (1978) suggested that parents who respond positively to their young children's attempts to independently master their environments, including exploration and attempts to master challenging tasks, facilitate the development of high levels of perceived competence and mastery motivation. In contrast, parents who discourage or punish independent behavior may lead their children to perceive themselves to be incompetent and to be unwilling to take on and master new challenges. Similarly, Wachs (1992), White, Kaban, Shapiro, and Antonucci (1976) and others have emphasized the importance of both visual and physical exploration in cognitive growth in infancy.

Parent adapts the home environment to the child vs. expecting the child to adapt to the environment. In order to safely allow the child to explore the home environment, it is necessary to "child-proof" the home as much as is possible. Child-proofing includes covering electrical outlets, putting cleaning products and other chemicals in child-proof cabinets, using gates to restrict access to stairs, and keeping breakable or precious objects out of reach of the child. Parents also need to ensure that toys are age-appropriate and safe.

3g. Family Routines

Family routines provide a predictable structure to a child's day. Routines and the regularity of family life have been found to play an important role in educational and behavioral outcomes among school-age children (Maccoby & Mookin, 1992). For instance, family routines may protect the health and well-being of family members by providing them with a source of stability and predictability, especially during periods of stressful transitions (Boyce, Jensen, Sherman, & Peacock, 1983).

Routines are beneficial for children in several ways. Keltner (1990) found that among low-income black children enrolled in Head Start, those whose families had predictable routines such as regular meal and bedtimes, were more likely to show interest and participation in preschools. Routines may also be associated with relatively stable conditions within a family. For instance, the regularity with which parents leave and return from work likely affects the predictability of a child's day. Stability has been found to be associated with secure infant-other attachment and the maintenance of security across time (Vaughn, Egeland, Sroufe & Waters, 1979). Routines that may be particularly relevant for infants and young children include regular timing for meals and snacks, and regularity in afternoon nap and evening bedtimes. This regularity may be particularly important for some children who have temperamental difficulty adapting to changes in routines. The ability to establish and maintain routines may also reduce conflicts between parents and children. Predictable routines are also related to positive sense of parenting competence among mothers of infants (Sprunger, Boyce, & Gaines, 1985).

Planning. Planning is a cognitive ability that is crucial to adaptive functioning in many domains, including academic performance (Gauvain, 1997). Parents who demonstrate strong planning abilities in their day-to-day lives (e.g., planning birthdays, vacations, daily schedules) and for longer-term goals (e.g., saving for children's education and for retirement) may facilitate the development of planning skills in their young children as well (Palkovitz, 1997).

3h. Attitudes about Culture, Ethnicity, & Race

Parental activities to teach children about their cultural/racial/ethnic identity may improve emotional and behavioral outcomes among children (Spencer, 1985). Parents' positive attitudes toward their own ethnicity, and the observance of cultural traditions may have indirect positive influences on young children and may set positive precedents for the future (Spencer, 1985). Preliminary analyses of the Early Childhood Longitudinal Study-Kindergarten (ECLS-K) field test data show that family cultural/racial/ethnic identity is highly correlated with levels of cognitive stimulation (Child Trends, 1997c).

Both racial/ethnic socialization and gender socialization figure prominently in the development of children's self-esteem and motivational processes (Maccoby & Martin, 1983; Marshall, 1995) and have only recently been included in major research on child development and school achievement (e.g., ECLS-K).

3i. Morality, Spirituality and Religiosity

Parents' religiosity. Parental religiosity, including high levels of religious involvement and commitment, is associated with lower levels of cohabitation, divorce, and nonmarital childbearing, and higher levels of marriage (Thornton & Camburn, 1987). Higher levels of maternal and paternal religiosity predicted higher levels of marital interaction quality and spousal support, and lower levels of conflict, all of which were associated with better parenting (Brody, Stoneman, Flor, & McCrary, 1994). Greater parental religiosity is related to more cohesive family relationships, lower levels of interparental conflict, and fewer externalizing and internalizing problem behaviors in children (Brody, Stoneman, & Flor, 1996).

Moral and ethical guidance. The acquisition of a moral framework and values is a central aspect of human development (National Commission on Children, 1991c). Considerable research has suggested that highly prosocial and moral orientations are fostered in families where parents are strong, consistent role models of moral and prosocial behavior.

3j. Child Relationships with Nonresidential Biological Parent, Grandparents, and Other Kin

Contact with biological parent not in the household and nonresidential parent's motivation. One important component of father involvement is the level of contact between nonresidential fathers and their children. Levels of contact are associated with positive child outcomes (Marsiglio, 1995). Involvement levels among absent fathers have been shown to depend on fathers' identification with roles associated with being a parent (Ihinger-Tallman, Pasley, & Buehler, 1995), and with custody arrangements (Marsiglio, 1995). One important construct to measure in a survey of absent fathers is to capture motivations to become responsible fathers who are committed to enhancing their child's well-being through positive involvement with them (Working Group on Conceptualizing Male Parenting, 1997).

Contact with Grandparents and Other Kin. Grandparents may play a variety of roles in children's lives (Jendrek, 1994). These include a custodial relationship (where the grandparent has legal or de facto responsibility for the child); coresidential arrangements (where the household contains an extended family); day care (where the grandparent cares for children while the parent(s) work, either in the grandparent's home or the child's home); or merely familial (with no formal responsibilities on the part of the grandparent). Grandparents and other kin represent social supports for parents, particularly among ethnic minority communities. The extended family plays an important role, including the provision of child care, material and emotional support (Harrison, Wilson, Pine, Chan, & Buriel, 1990). Creating arrangements that enable friends and kin to share resources and household responsibilities are common sources of support among African-Americans, particularly those who are economically disadvantaged (Gibbs & Huang, 1989; Staples & Johnson, 1993).

For several reasons, grandparents have been seen to be increasingly important as sources of support for children. These include increased marital disruption, teenage pregnancy, drug addiction, and maternal employment (Burton, 1992; Cherlin & Furstenberg, 1986; Jendrek, 1994; Minkler et al., 1992). Particularly in the African-American family, grandparents may serve as a safety net when parents are unable to care for them. Research on grandmothers providing custodial care indicates that grandmothers often said that they stepped forward to prevent their grandchildren from being placed in foster care (Jendrek, 1994; Minkler et al., 1992). While little previous research has directly linked grandparents' involvement with child outcomes, increasing interest in the grandparent role indicates that such a link may be extremely important, particularly in families where children receive only weak support from parents.

3k. Sibling Characteristics; Sibling Adjustment to Baby.

Sibling Adjustment. The arrival of a new sibling necessitates a reconfiguration of family relationships, including the amount of time and attention an older sibling receives from his/her parents. Dunn and her colleagues (Dunn & Kendrick, 1982; Dunn & Munn, 1986; Dunn, Stocker, & Plomin, 1990) have found that the quality of the initial adjustment of a sibling to a new infant is greatly affected by the behavior and attitudes of the parents. Parents who talk to the older child about the needs and feelings of the baby tend to foster positive feelings on the part of the older child. Additionally important, however, is the ability of the parent to maintain focus on the needs of the older child as well. The quality of the sibling's initial adjustment to the infant may in turn affect the nature of the ongoing relationship, with implications for social behavior outside of the family as well.

Sibling Relationships. Sibling relationships vary tremendously in the extent to which they are conflictual versus positive. Dunn and Munn (1986) found that friendly behavior directed toward a younger sibling by an older sibling was associated with the younger sibling's development of relatively mature behavior in both conflictual and cooperative situations. Interestingly, the younger sibling appeared to have a similar positive effect on the older sibling's social behavior. Sibling relationships affect not only the children involved, but the parents as well. Crnic and Greenberg (1990) report that the item "sibling arguments require referee" is a significant contributor to the scales of daily hassles in parenting.

3l. Parenting and the Neighborhood

Neighborhoods have a number of effects on parenting, and influence the effects that variations in parenting have on outcomes for children. Some researchers have found that, although the authoritative, autonomy-encouraging style of parenting appears to result in the most positive outcomes for middle-class children, this may not be the case for families living in poverty, particularly in urban environments. In such environments, a more authoritarian, child rearing style of parenting may be more beneficial due to the more dangerous and chaotic conditions that exist outside of the household (e.g., Dubrow & Garbarino, 1989). Parent ratings of how often mothers in her neighborhood have other children over to play; the sense that other adults in the neighborhood would help their child quickly if their child was outside and got hurt, was frightened, or upset; and whether the neighborhood is too dangerous to permit the child to play outside except when closely supervised, give an indication of whether parenting style is affected by the neighborhood environment.

Another neighborhood or community factor that may moderate the impact of various parenting practices on children's development involves the normative parenting practices within that community. In neighborhoods where spanking is the norm, for example, spanking may have a less deleterious effect on children's peer relationships than in neighborhoods where few of the child's peers are spanked.

3m. Parental and other Family Relationships

In recent years, there has been a growing recognition of the direct and indirect influences of the interrelations among all family members on children's development.

Parents' marital satisfaction/ Family conflict. Marital satisfaction has been found to have an impact on both mothers' and fathers' relationships with their young children. Considerable research has been conducted to examine the impact of family conflict on young children. Marital conflict, in particular, has been found to be associated with child behavioral and emotional disturbances, problems with interpersonal interaction, and diminished academic performance, including poor grades and teacher reports of problems in achievement and abilities. Using a maternal daily diary methodology, Cummings and his colleagues have found that the greater the frequency of such conflicts, the more difficulties exhibited by children (Cummings & Davies, 1994).

Marital conflict may impact young children in two ways. First, marital conflict has been shown to have negative effects on parenting behavior, thus negatively affecting the parent-child relationship and child outcomes (Belsky, 1984). Further, a number of studies have demonstrated that there are more direct effects of interparental anger and conflict on children. From early infancy, children have been found to exhibit behaviors indicative of distress and arousal when exposed to "background anger" such as conflicts between spouses or other family members. Short-term disruptions in children's exploratory and play activities have been found under naturalistic laboratory conditions by Cummings and his colleagues (Cummings & Davies, 1994), and conflict between parents in the home and between biological parents who do not reside together has been found to negatively influence children's psychological adjustment (Grych & Fincham, 1990; Shaw & Emery, 1987). Cummings, Zahn-Waxler, and Radke-Yarrow (1981) found that 1- to 2-year-olds attempted to intervene between angry parents with comforting or distracting behavior. Although such behavior may not on the surface appear negative, it is considered inappropriate and burdensome for such young children and may interfere with other important tasks, such as exploration. There is evidence that the children of married parents in high conflict relationships have adjustment problems that are similar to those experienced by children of single parents (Hanson, 1993; Peterson & Zill, 1986).

Conflict resolution styles. Not all forms of marital conflict are equally detrimental to children (Cummings & Davies, 1994). One important factor appears to be the parents' ability to reach resolution. Even among 2-year-olds, aggression and distress following interadult conflict diminishes substantially following complete conflict resolution (Cummings, Iannotti, & Zahn-Waxler, 1985). Another factor appears to be the content of the conflict. Children appear to be particularly disturbed by conflicts pertaining to child rearing. A third factor is whether the conflict involves physical aggression, as will be described below.

It is not only interparental conflict, but other forms of family conflict and coercion that appear to have negative effects on young children. Patterson (e.g., Patterson & Dishion, 1988) and his colleagues have conducted a series of studies of school-age boys identified as exhibiting aggressive behavior problems. All members of these boys' families, including parents and siblings, are characterized as exhibiting high levels of coercive behavior toward each other. Even very young children in these families may learn that the way to influence the behavior of others (to get some desired reward or to end a verbal or physical attack) is to use coercion and countercoercion. Such behaviors, although they may be effective in the immediate family environment, put children at risk for academic and social difficulties within the school setting.

In addition, marital withdrawal is emerging as an important variable in predicting poorly supported parenting. Net of maternal education and depressive symptomatology, marital withdrawal has been found to be more predictive than marital conflict of more detached, less sensitive parenting, especially among mothers of infants (Cox, Paley, Payne, & Burchinal, in press).

History of family aggression and violence/Family cohesion. As noted above, not all forms of interparental conflict are equally bad. Exposure to physically violent conflict, in particular, is associated with serious behavioral and emotional disorders in children (Cummings & Davies, 1994; Debowitz & King, 1995; Grych & Fincham, 1993). In addition, children in homes where domestic violence is happening between adults are much more likely to be battered themselves. Among battered women, 85 percent report that their children are abused as well (Straus, Gelles, & Steinmetz, 1980). In contrast to family conflict and violence, family cohesion is associated with positive outcomes for children.

Social supports. Parents, especially those unemployed or economically disadvantaged, and those experiencing stress, benefit from access to social support. Support for parenting is an aspect of marital quality that has been found to affect the quality of parenting provided to children and child outcomes such as attachment security (Belsky & Isabella, 1988; Goldberg & Easterbrooks, 1984; Isabella & Belsky, 1985). The availability of a variety of social supports to the parent is associated with the security of infant-mother attachment (Crockenberg, 1981). Access to social support is negatively associated with depressive symptoms among unemployed women (Hall, Williams, & Greenberg, 1985), and contributes to more positive parent-child interactions (Crnic & Greenberg, 1990; Weinraub & Wolf, 1987). For example, Hashima and Amato (1994), using data from the National Survey of Families and Households, found that for families living in poverty with young children, higher levels of social support was related to less punitive behavior.

3n. Gender Typing

Across the life-span, gender is one of the most salient characteristics that individuals have, both for themselves and for those with whom they interact. The importance of gender in determining the experiences that a child has will begin at birth. Parents tend to treat male and female babies differently from birth (Berk, 1989), and reinforce gender-typed behaviors (e.g., Fagot, 1985; Will, Self, & Datan, 1976). Growing up in differential learning environments has implications for children's psychological development (Block, 1983). Specifically, the fostering of achievement and encouragement of instrumental activities among boys at the expense of encouraging expressive behaviors may have negative ramifications for boys' interpersonal skills. Likewise, emphasizing expressive behaviors and interpersonal skills among girls at the expense of encouraging achievement-related behaviors may have negative implications for their developing a sense of autonomy and competence related to achievement activities.

Considerable work has been done on gender socialization and educational outcomes, suggesting that such socialization is problematic for girls (Eccles, Adler, & Meece, 1984; Maccoby, 1990). Since gender is such a powerful focus of socialization at a very young age, it seems appropriate to begin to look at these issues very early on.

3o. Family Time Use

Thornton (1995) suggests that time use information provides a key source of information for studying child and family well-being, because time use data provide a broad source of information on people's activities, interactions, and involvement in family and community. The daily activities of family members, particularly the types of activities that they engage in together and the routine assignment of household tasks, have been found to be associated with marital satisfaction (Coltrane, 1996). In addition, the types of tasks that mothers and fathers assume in two-parent households may have implications for a number of aspects of child development (Parke, 1996). Of particular importance for children may be the distribution of child care responsibilities between parents and other members of the household. Typically, mothers assume primary care of infants and toddlers, even in households where both parents work full-time (Coltrane, 1996; Parke, 1996). Mothers also spend more time overall with their young children than do fathers and spend a greater percentage of their time with their children in child care activities (e.g., feeding, diapering, bathing, comforting). American fathers, in contrast, spend the largest proportion of their time with their young children in play.

Some studies have suggested that fathers' involvement with young children, including caregiving, may be positively associated with children's cognitive and social development (Parke, 1996). In one study conducted in Ireland with working class families, for example, Nugent (1991) found that the level of fathers' participation in child care was positively associated with infant scores on the Bayley Scales of Infant Development at 12 months of age.

Other indicators of cognitive development have also been found to be positively associated with the amount of contact that fathers have with their infants, especially sons (Parke, 1996).

4. CHILD CARE

A high and rising proportion of children spend time in nonmaternal care, and an increasing number of them enter this care at a very young age. The NICHD Early Child Care Research Network (1996b) found that 64 percent of their sample were in some form of nonmaternal care at age nine months. In the U.S. as a whole, 19 percent of those age less than 1 year with employed mothers were in center-based care in 1993, with the remainder in informal types of care such as care by a relative or family day care provider (U.S. Bureau of the Census, 1993). Though child care is an important area of study, the complex, dynamic and fluid patterns of care that children often experience present a challenge for researchers. Children may experience multiple forms of care that are used regularly within a certain period; for example, they may attend preschool several mornings a week and be cared for by a relative the rest of the time. They may also experience multiple changes in their primary form of care over their first few years of life. Even children who are consistently cared for by one provider have the need for backup care when they are sick or their regular provider is unavailable; the availability of such backup care has important implications for maternal employment. For these reasons, information on child care is often collected in a calendar format. This approach allows characteristics to be gathered concerning multiple forms of care during a single time period, changes in child care providers over time, and the availability and characteristics of backup care.

At a recent meeting to inform the child care components of state welfare evaluations, child care researchers concluded that the quality of data on child care characteristics is considerably improved if both parents and providers are contacted to provide information (Child Trends, 1997d). Parents are good sources of information about the number and type of arrangements used; the number and ages of children present; the number of child care providers present; the relation of the mother to the provider; whether the care setting is licensed; how much the household pays for child care arrangements; assistance/subsidies in paying for care; the location of care; the convenience of getting to care; the number of times the parent has missed work or been late due to child care problems; whether the parent would change the current form of care if they could; and other aspects of work and child care strategies. Providers are good informants about caregiver education, training and salaries; characteristics of children in care such as the number, age, and proportion receiving subsidies; intentionality of the caregiver, meaning whether he or she has chosen child care as a profession, works primarily to make money, or works primarily to be with his or her own children while earning money; and whether providers have authoritarian child rearing attitudes. Other aspects of child care require on-site observation for reliable measurement. These include the quality and quantity of caregiver-child interaction, of child peer interactions, and of child task-orientation (as opposed to aimless wandering). On-site observations can also yield information about the physical characteristics of the setting and safety.

4a. Type, Cost & Travel Time

Type/site of care. A number of research studies have provided evidence that maternal employment and non-maternal care do not harm young children (Hayes & Kamerman, 1983; Hayes et al., 1990; Kamerman & Hayes, 1982; NICHD Early Child Care Research Network, 1997b). For low income families where the mother enters the labor force voluntarily, studies have shown that such employment had generally positive or neutral effects (Zaslow & Emig, 1997). However, the quality and consistency of child care have been found to have important implications for children's development. The type and site of care are closely associated with other variables affecting quality, such as the availability of contact with peers, planned educational activities, and whether care takes place in a child-centered environment. Children cared for in their own homes generally have less contact with other children; also, the setting tends to be oriented for adults. At the same time, home care usually has a lower adult-child ratio. Family-based day care may provide more opportunities for contact with other children, but is usually not provided in a child-centered environment. Center based care provides more opportunities for group activities, adult-child interaction and socialization; caregivers are also more likely to be trained, and the environment is more likely to be child-centered. These factors were found to affect children's scores in tests of social and cognitive competence (Clarke-Stewart, 1989; Harms, 1992; Kisker, Hofferth, Phillips, & Farquhar, 1991).

Parents who place a higher value on developmental characteristics of care have been found to be more likely to choose center care, and children from households with incomes under $30,000 and whose mothers have less than a high school education are less likely to be in center-based programs at age three and four (Johansen, Leibowitz, & Waite, 1996; National Center for Education Statistics, 1994). Relatively little research has been done on informal types of care such as care by a babysitter, the father or another relative in the home, although these remain an important form of care for many children (Harms, 1992; Hofferth, Brayfield, Deich, & Holcomb, 1991). In a study of the effects of early father child care on child outcomes, Averett, Gennetian, and Peters (1996) found that fathers are most likely to provide child care when mothers are either working on a night shift or working part time. They found that relative to other types of child care, father care in the first year of life is associated with positive developmental outcomes among children. However, while parental care is most important during the first year of life, Averett and colleagues suggest that nonparental care in the second or third year of life is associated with high levels of social interaction and cognitive stimulation that may be more appropriate and beneficial for children at these developmental stages. Research on the child care usage and preferences of AFDC mothers with children under three suggests that while relative care is most often used, mothers who use center-based care are more likely to describe themselves as satisfied with their choice of care. Thus, while only 16 percent of mothers in an AFDC sample with young children used group care, nearly half of the mothers interviewed stated a preference for group care (Sonenstein, 1991).

Costs of care. Child care prices are closely associated with their quality, as measured by such factors as training and education of providers and the child/provider ratio. Higher costs for parents consistently reduce the likelihood that families will choose center-based care, and are a stronger predictor of the type of care chosen than many measures of quality such as the child-adult ratio (Hofferth, 1991; Hofferth & Wissoker, 1992). Hofferth et al. (1991) found that many working parents spend a substantial proportion of their income on child care. This can reduce the resources available for other purposes and place parents under stress. High child care costs may keep some parents who would prefer to work out of the labor market, and force others into low quality arrangements.

Convenience, affordability, difficulty in finding care, and availability of back-up care. Child care considerations have a crucial impact on the mother's ability to get and maintain a job. Presser and Baldwin (1980) found that low income mothers were particularly likely to report that they would enter the labor force or seek more hours if affordable child care was available. Meyers (1993) reported that those parents who miss more days of work due to child care are also more likely to drop out of job training programs. Hofferth and Collins (1996) reported that mothers earning low wages (defined as under $6 per hour) without a conveniently located center-based program (within 30 minutes) were more likely to leave their jobs. Among the groups of mothers studied, those earning moderate wages (defined as $6-8 per hour) were most likely to leave their jobs as the price and instability of care increased. Research examining factors measuring convenience and cost has shown that parents may be more likely to choose care which maximizes their own utility over those benefitting the child (Johansen et al., 1996).

Auspice of care. Whether child care is formal or informal, and in the case of formal care whether the center is not for profit/ for profit, independent, part of a chain, religiously affiliated, etc. has important implications for other measures of child care quality (Friedman & Amadeo, in press).

4b. Extent

Age first in child care. While there is some evidence that maternal employment that begins during the first year of a child's life can have a negative impact on children at various income levels (Baydar & Brooks-Gunn, 1991; Belsky & Eggebeen, 1991), there is little consensus on this issue. The NICHD Early Child Care Research Network (1997b) found that while child care in the first year did not have a negative effect, children in high quality child care settings scored higher in tests of cognitive and linguistic development. Desai et al. (1989) found that while boys in higher income families were negatively affected by maternal employment in the first year, other groups were not. They also found no relationship between either the number of hours worked or the total time worked during the first three years of life and children's intellectual ability. One recent paper suggests that the negative effects found in earlier studies may have been due to oversampling of younger mothers in the data used (Smith, 1997).

Hours per week in nonmaternal care. Research findings on the effect of time spent in nonmaternal care have been inconsistent. Belsky and Rovine (1988) and Clarke-Stewart (1989) found that infants that experienced routine nonmaternal care for 20 or more hours per week during their first year of life were significantly more likely to be classified as insecurely attached to their mothers. Some have argued that spending long hours away from a baby may affect the mother's ability to be responsive to her child (Brazelton, 1985; Sroufe, 1988). Yet Roggman, Langlois, Hubbs-Tait, and Rieser-Danner (1994) found no significant association between time in nonmaternal care and attachment security. The NICHD Early Child Care Research Network (1996b) has found that infants' attachment to their mothers is most strongly affected when they experience "dual risk": long hours in child care combined with low ratings on sensitivity in the home environment. Hours spent in care had opposite effects for boys and girls when other factors were controlled: boys were more likely to be insecure if they spent 30 or more hours in care while girls were more likely to be insecure with less than 10 hours in care (NICHD Early Child Care Research Network, 1996b). In a later study (NICHD Early Child Care Research Network, 1997b) they found that hours in care did not have a significant relationship on cognitive development for two-year-olds.

4c. Quality

Quality of care has been found to be the crucial factor in the impact of child care on children's cognitive and social development. In all forms of child care, information on such features of care as group size, caregiver-child ratio, and qualifications of the care providers will shed light on the quality of the child's alternative care experiences. Quality of care and stability of care over time have been found to be related to children's cognitive and socioemotional development (Hayes et al., 1990; Whitebook, Howes, & Phillips, 1989; Zaslow, 1991). While child care arrangements can alter the effects maternal employment has on children in the first year of life, children living in poverty are the most vulnerable to negative child-care effects (Baydar & Brooks-Gunn, 1991). Howes (1988) found that with family characteristics controlled, higher quality early child care (center or family day care) was predictive of better academic progress, better school skills, and fewer behavior problems in boys, and of better school skills and fewer behavior problems in girls at the end of first grade. Similarly, preschool students in model child care centers exhibited more complex play patterns than their peers at marginally adequate centers (Howes & Matheson, 1992). As stated earlier, the NICHD Early Child Care Research Network found that while child care did not have a negative effect on young children, children in high quality child care settings scored higher in tests of cognitive and linguistic development.

Licensing/accreditation. State regulations for child care provide clear-cut minimum criteria for child care providers, for example, adult-child ratios (Phillips, Lande, & Goldberg, 1990). Accreditation of the child care arrangement or provider has been found to have positive impact on the complexity of play, adaptive language scores, and the security of attachment to providers, and to have a negative association on behavior problems such as aggression, anxiety and hyperactivity (Howes, Smith & Galinsky, 1995).

Group size. Larger group size has been found to affect quality of care in center based care. Several studies have shown that caregivers for larger groups of young children are less responsive, less socially stimulating and more restrictive (Howes, 1983). Larger group size has also been found to increase distress, apathy and potentially harmful behavior in infants and to negatively affect social competence, cooperation and involvement in tasks, verbal initiative, and cognitive test scores among older children (Clarke-Stewart, 1989; Holloway & Reichart-Erikson, 1989; Ruopp, Travers, Glantz, & Coelen, 1979). However, some studies have found that child-adult ratio was a more important predictor than group size in center-based care (Burchinal, Roberts, Nabors, & Bryant, 1996; Scarr, Eisenberg, & Deater-Deckard, 1994; Whitebook et al., 1989). In home-based care, group size has more consistently been shown to have negative effects with caregivers being less sensitive, less responsive, and engaging in less interaction with children when they are caring for larger groups (Howes, 1983; Stallings, 1980). The NICHD Early Child Care Research Network data (1996b) found that group size is important for positive outcomes in infant care in both home and center-based settings, though older children may benefit from larger group size than infants.

Child-adult ratio. Several studies of outcomes for toddlers in center based care have shown that lower child-adult ratios have a considerable positive impact (Allhusen, 1992; Ruopp et al., 1979; Whitebook et al., 1989). NICHD Early Child Care Research Network data (1996b) has shown that sensitivity of caregivers' responses for infant care are closely related to the child-adult ratio, with 1:1 ratio settings scoring considerably higher than others. This finding applies to both home and center-based settings. For pre-schoolers, results have been less consistent, however (Clarke-Stewart, Gruber, & Fitzgerald, 1994; Ruopp et al., 1979).

Curriculum. The research literature suggests the particular importance of whether or not a child has taken part in a Head Start or preschool program with an educational focus. Early childhood educational experiences and providers may play a significant, positive role in the lives of disadvantaged children (Berruetta-Clement, Schweinhart, Barnett, Epstein, & Weikart, 1984; Burchinal, Lee & Ramey, 1989; Darlington, Royce, Snipper, Murray, & Lazar, 1980; Lee, Brooks-Gunn, Schnur, & Liaw, 1990; McCartney, 1984; McKey et al., 1985). Depending on the type of arrangement, and level of parent participation required, studies of Head Start Programs suggest that the experience may have positive effects on the mother as well as the child (Parker, Piotrkowski & Peay, 1987). The appropriateness or nature of an educational curriculum for infants and toddlers is less clear, though recently publicized studies suggest that appropriate stimulation of even very young children is important to intellectual development.

Education and training of caretaker; intentionality of caregiving role. Provider education has been found to have a positive association with children's social competence, cognitive development and expressive language (Burchinal et al., 1996; Clarke-Stewart, 1989; Ruopp et al., 1979). Providers with at least two years of college education were more likely to promote verbal and other skills; those with degrees in early childhood education were more likely to encourage academic skills (Logue, Eheart, & Steinkamp, 1989). Provider training also has a positive association with children's cooperation and persistence in tasks and activities and on cognitive test scores (Clarke-Stewart, 1989; Ruopp et al., 1979). Family day care providers with child-related training were found to provide more teaching activities and to have more interaction with children (Stallings, 1980).

Caregiver experience. Research on the effect of child care providers' years of experience on child care quality has shown inconsistent results. Some studies have rated caregivers with more years of experience as being more warm and responsive (Dunn, 1993; Howes, 1983; Kontos & Fiene, 1987); others have found them to give more detached and harsh care (Galinksy, Howes, Kontos, & Shinn, 1994).

Authoritarian attitudes about care giving. Nonauthoritarian child rearing beliefs have been found to be related to higher ratings and frequencies of positive caregiving in a variety of settings (in-home relative care, in-home nonrelative care and center based care) by the NICHD Early Child Care Research Network (1996a). Similar findings were also reported by Arnett (1989) and McCartney (1984).

Facilities/ physical environment. Centers and child care homes with better organized space and more varied materials have been found to be associated with more stimulating care (Dunn, 1993; Howes, 1983; Scarr et al., 1994). Few researchers have analyzed this dimension of child care quality however. The NICHD Early Child Care Research Network (1996b) found that home and center based environments rated as safe, clean and stimulating were more likely to invoke positive caregiving ratings.

4d. Consistency/turbulence

Although maternal employment and non-maternal care have not been found to harm children, the consistency of care has been found to have important implications for the development of young children. Turbulence in child care may occur because a parent changes arrangements, or because of a high turnover of caretakers within a single child care setting. Children who experience a greater number of changes in child care arrangements have been shown to engage in less complex forms of play (Howes & Stewart,

1987) and to have more problems in school as first graders (Howes, 1988). The NICHD Early Child Care Research Network (1996b) found that a high number of changes in child care providers had a negative effect on the security of attachment to the mother when combined with low scores for mothers on sensitivity in play. Whitebook, et al., (1989) found that children in centers with higher annual teacher turnover rates spent less time engaged in social activities and more time wandering aimlessly. A greater number of changes in the primary caregiver in a day care setting have been found to be associated with a greater occurrence of aggressive behavior (Howes & Hamilton, 1993).

5. CHILD CHARACTERISTICS

Some early child characteristics may be risk factors for later development. In some cases, problems evident in early infancy may be so extreme as to inevitably lead to some relative deficits in cognitive or socio-emotional development. In other cases, infant characteristics interact with characteristics of the caregiving environment to promote or undermine positive developmental outcomes. Child characteristics that make that child more difficult to manage may increase the chances of poor caregiving, and consequently poorer outcomes. In addition, problems evident at birth, such as low birth weight, may themselves be a result of negative environmental conditions that will persist across childhood and continue to undermine healthy development. In a pivotal paper published in 1975, Sameroff and Chandler reviewed the literature on outcomes for children with various risk factors at birth and concluded that there were few, if any, long-term effects that could be attributed to those factors alone. When high-risk infants did exhibit long-term cognitive and social deficits, these tended to be more strongly associated with conditions within the child's social environment rather than with deficits apparent at birth. This conclusion is continuing to be reevaluated, particularly in light of new medical procedures that have increased the chances of survival for high-risk infants.

5a. Infant/Child Temperament

Temperament is generally defined as individual differences in a set of personality characteristics that appear early in life and have some constitutional, biological basis. There are several different approaches to the assessment of temperament, each focusing on different specific dimensions. Among the behavioral dimensions most commonly included within the construct of temperament are the following: 1) approach to vs. withdrawal from novel or exciting stimuli; 2) sociability; 3) attention; 4) activity level; and 5) negative emotionality (Goldsmith et al., 1987). Temperament is most commonly assessed via parental report, although observer-report and structured laboratory measures are available as well (Goldsmith & Rieser-Danner, 1990). Longitudinal studies of temperament in infancy and early childhood have found moderate stability for some temperament dimensions across the infant-toddler period and early childhood (Broberg, Lamb, & Hwang, 1990; Field, Vega-Lahr, Scafidi, & Goldstein, 1987; Matheny, Wilson, & Nuss, 1984; Riese, 1987; Rothbart, 1986), particularly for infants who were extremely high or low on a particular temperamental trait (Kagan, 1989; Kagan, Reznick, Snidman, Gobbins, & Johnson, 1988).

The assessment of temperament may be important for a number of reasons. First, although intelligence is not included in the domain of temperament (Goldsmith et al., 1987), some dimensions of temperament may influence cognitive development and later academic performance through the variations in experiences that infants create for themselves. For example, infants and toddlers who vary along the approach/withdrawal dimension differ in the extent to which they seek out and enjoy, versus shy away from and fear, novel stimulation. Infants who are highly inhibited may limit their own exposure to new experiences, thereby limiting their own learning opportunities. In contrast, infants who enthusiastically approach new experiences and situations may expose themselves to a wider variety of learning opportunities. A number of studies have reported positive associations between responses to novelty in infancy and later intelligence (Colombo & Fagen, 1990; Rose, 1989). In contrast, high activity level and short durations of attention have been associated with less persistence and poorer performance on tests of infant development, and may continue to impede learning later on (Seegmiller & King, 1975).

A second way in which temperament may affect cognitive and social development involves the interaction between individual characteristics and characteristics of the environment. The same characteristics of the social and physical environment may have different impacts on children with different temperamental characteristics--resulting in differing outcomes for those children. In describing their findings from the New York Longitudinal Survey, Thomas and Chess (1977) emphasized that the impact of temperament on later development, as well as the impact of the environment, must be considered in light of the goodness of fit between the two.

5b. Health Limitations and Disabilities

Clearly, both physical and cognitive limitations are likely to have a dramatic impact on the future development of the child. By definition, children with developmental delays and mental retardation learn at a slower rate than do other children. Research has demonstrated that school-age children with mental retardation have been found to be lower on measures related to mastery motivation (e.g., curiosity, preference for challenging tasks, preference for novelty) compared to non-retarded children of a similar mental age (Harter & Zigler, 1974). One study found that preschoolers with physical disabilities also displayed lower levels of persistence on problem-solving tasks than did other children. Low levels of such characteristics may put both physically and mentally challenged children at risk for increasingly poor performance across time.

Both developmentally delayed children and those with physical impairments but without delays in mental development may, from an early age, experience social and physical environments that are more controlling and restrictive than do others. Parents may react to a child's disabilities by removing challenging aspects of the environment to the extent possible in an effort to avoid making the child feel frustrated or to avoid potential injury. Interestingly, studies with infants and toddlers with Down Syndrome have found few differences in mastery-related behaviors (MacTurk, Vietze, McCarthy, McQuiston, & Yarrow, 1985; Ruskin, Mundy, Kasari, & Sigman, 1994), again suggesting that the later differences are the result of differences in experience, rather than status. Recently, Hauser-Cram (1996) reported a study comparing mastery motivation in toddlers in three groups (those with motor impairments, those with developmental delay, and those developing typically), which looked both within and across these groups for the associations between maternal interactive style and toddler mastery motivation. Hauser-Cram reported that there were some neurobiological conditions that appeared to have a direct effect on motivation--notably a history of seizure disorders, although it was speculated that this may be due to the effects of anticonvulsant medications rather than the disorders themselves. Most of the variation both across and within groups in this study, however, was associated with maternal behavior. Mothers who provided clear and usable information to their children during a teaching task, but who were also emotionally positive and uncontrolling (in that they provided verbal information and modeling of correct actions but did not physically intervene in the child's mastery attempts) had children who demonstrated greater mastery motivation. Such behavior was more typical among mothers of typically-developing toddlers, but it had the same positive effect on children within all three groups.

6. CHILD OUTCOMES

Child development is a transactional process whereby current characteristics of the child may be seen as outcomes of both current and preceding conditions and experiences. In turn, however, current characteristics influence the experiences that children have within their environments in ways that affect future cognitive, social, and emotional development (Sameroff & Chandler, 1975; Sroufe & Fleeson, 1986). The multiple components of child outcomes addressed in a national survey of children encompass aspects of readiness to learn.

Readiness to learn. One of the national goals for education in the year 2000 is to have all children start school ready to learn. By the time children enter elementary school, they have widely varying levels of preparation, which is likely to have an impact on their experiences and accomplishments in school. The National Education Goals Panel has identified several dimensions of school readiness, including physical well-being and motor development, socioemotional development, approaches toward learning, language use, and cognition and general knowledge. These dimensions are embedded in three categories of child outcomes in the grid. We consider child outcomes here within three broad categories: 1) health, growth and child safety; 2) cognitive development; and 3) socioemotional development.

6a. Health of Child; Physical Growth; Child Safety

Overall health. The importance of children's health for school success is recognized in the National Education Goals formulated in 1990: "Children will receive the nutrition and health care needed to arrive at school with healthy minds and bodies...." Overall ratings of children's health as well as access to health care are strongly related to income. Children in families with more economic resources are more likely to be in excellent health, with no limiting conditions such as developmental delays. In general, poor children are two to three times as likely to have several health problems such as delayed immunization, lead poisoning, and severely impaired vision (Starfield, 1992).

Current height and weight. By 2 years of age, individual differences in height are good predictors of adult height (Lowrey, 1978). Additionally, small size and weight can be an indicator of malnutrition, as will be discussed below. Although the social or cognitive implications of obesity in infancy have been less well-studied than have the implications of malnutrition and underweight, clearly obesity has implications for the responses children receive from the social world, and may affect the child's ability to adequately explore the physical world as well.

Poor growth/failure to thrive. More important than size is age-appropriate growth. Failure to thrive is defined as a failure to grow at expected rates that cannot be attributed to known physical causes. The cause of failure to thrive is a lack of adequate nutrition, although the underlying reasons for this deficiency may be several. Maternal characteristics that lead to unpleasant feeding interactions and lack of adequate nutritional intake on the part of the infant are one frequently-proposed cause. Outright abuse or neglect is sometimes suspected. Studies have found that families with malnourished children differ from other families, even when social class or SES is the same. Mothers of infants who are malnourished and who exhibit inadequate growth have been found to provide less cognitive, social, and emotional stimulation to their infants (Wachs et al., 1992), sometimes even before they become malnourished (Cravioto & DeLicardie, 1976). In some cases, child characteristics such as colic may make feeding difficult and lead to poor growth.

Whatever the cause, the undernourishment that is indicated by failure to thrive and poor growth may have continuing negative effects on later physical, intellectual and socio-emotional development (Dwyer & Argent, 1990). Poor nutrition in the first months and years of life, a time when the brain is rapidly developing, may lead to intellectual impairment (Balazs, Jordan, Lewis, & Patel, 1986). Although such effects do not seem to be entirely irreversible, problems in infancy may make a child more vulnerable to negative environmental conditions throughout childhood.

Malnourishment can lead to deficits in intellectual and social functioning for other reasons as well. Undernourished children tend to be apathetic and lethargic, which can lead to several related problems. First, both visual and physical exploration of the environment can be substantially reduced. Such exploration is thought to be crucial to cognitive development in the infant-toddler period (Cravioto & Arrieta, 1986). In one study, malnourished 2-year-olds were found to be less interested in their environment, less able to express emotions, and less actively involved with peers (Barrett, Radke-Yarrow, & Klein, 1982) than were other toddlers who received adequate nutrition. Second, low levels of responsiveness, along with poor appearance, can lead caretakers to provide less stimulation and positive interaction to the infant than the same caretakers might provide to a brighter, more active infant.

Presence of physical or cognitive disabilities / limiting conditions or health problems or developmental delays. Conditions and disabilities vary along a wide continuum of severity. Some conditions evident in infancy and early childhood have inevitable and dramatic effects on expectable outcomes for children. Others may exert their influence on children's social and cognitive development primarily through the manner in which they affect the child's social environment (Alexander & Entwisle, 1988). Even relatively mild conditions, such as chronic ear infections or allergies, may affect children's cognitive and social development.

Motor development. Individual differences in cognitive, perceptual, and socioemotional development, at least in the short term, are affected by the timing of accomplishment of some major milestones in motor development (e.g., crawling, sitting, walking), at least in part because of the importance of self-produced experiences for development (Bornstein & Lamb, 1992). For example, the onset of fear of heights appears to be strongly affected by the child's locomotor abilities (Campos, Bertenthal, & Kermoian, 1992). Although it is unclear what the long-term implications of these individual differences in timing may be, substantial delays due to physical, perceptual, or cognitive challenges may have additional implications for children's school readiness. These include that they may reduce the child's opportunities and abilities to act on their environments and to thereby learn about those environments. Further problems may arise if the parents and other caretakers respond to the child's challenges in ways that further limit opportunities.

Fitness. The recognition that physical fitness is an important focus of attention even during the early years of childhood has been increasing in recent years. The ability to master physically challenging activities can be an important source of success feedback for young children (Harter, 1978). Thus, overall fitness can have implications for children's developing perceptions of their own competence and self-worth.

Sleep patterns. Individual differences in sleep patterns may have implications for subsequent development for a number of reasons. In some cases, they may be indicative of differences in physiological self-regulatory abilities and temperament--differences that may affect children's experiences with both the social and the physical environment. Sleep disturbances may also be associated with other types of short- or long-term difficulties, including insecure attachment and excessive fearfulness.

Accidents and injuries. Accidental injuries, many of which can be prevented, are the leading cause of death for children older than age one (National Commission on Children, 1993). The frequency and severity of accidents and injuries sustained by children may be influenced by a number of factors. Children who are temperamentally more active or who are relatively fearless may be more likely to get into dangerous situations, thus leading to more injuries. Another factor, however, is the structure of the household and the ability of parents to supervise their children. Accidental injuries may thus be an important indicator of chaotic households, inadequate supervision, or unsafe living situations.

6b. Child's Cognitive Development

Developmental milestones/developmental delays. Few studies have found significant associations between the speed with which infants reach early developmental milestones and later intellectual functioning. However, the extent to which children reach particular sensorimotor and cognitive milestones (e.g., sitting, crawling, walking, shape sorting) may be associated in part with the kinds of physical and verbal stimulation they have received from their environments, and may also subsequently affect the kinds of physical and social feedback that the child receives. For example, parents of children who for one reason or another do not meet expectations for normal development (e.g., because they were born prematurely, have Down Syndrome or have other developmental disorders) have been found to be more intrusive with their infants. Although this is likely to be a reaction to unexpectedly low responsiveness on the part of the infant, it may unfortunately lead to increasingly negative interactions in the future. Thus, it may be particularly important to know how the child's functioning meshes or is discordant with the parents' expectations.

Ability to communicate/ Pre-literacy development. During the second year of life, infants begin to use language intentionally--that is, to convey meaning. Vocabulary increases dramatically during the latter half of the second year. Individual differences in both the amount and types of language used are affected by the language styles of parents (Nelson, 1973, 1981), as well as by the quality of the affective bond between infants and parents (Morisset, Bernard, Greenberg, Booth, & Spieker, 1990). One immediate effect of increasing linguistic skills is a reduction in negativity and frustration. Individual differences in the expression of negative emotion have been found to be associated with differences in language ability during this age period.

Approach Towards Learning. In addition to the other areas discussed in this report, approach toward learning has been suggested as an aspect of readiness. In infancy and very early childhood, approach toward learning may be seen in curiosity, exploratory and mastery attempts. Messer et al., (1986) found that mastery behavior at age 6 months was a better predictor of intellectual performance at 30 months of age than was infant "IQ" or "DQ" (developmental quotient). Similarly, some studies have found that a preference for novelty (vs. familiar stimuli) in infancy is positively associated with performance on IQ tests in childhood (e.g., Bornstein & Sigman, 1986; Colombo & Fagen, 1990; McCall, 1990).

6c. Child's Socio-Emotional Development

Discipline problems (including at child care). Child noncompliance becomes a major problem for some families, particularly during the second year of life when children routinely begin to express greater needs for autonomy (Belsky, Woodworth, & Crnic, 1996). Noncompliance often becomes part of a family interaction pattern in which parents use increasingly negative child rearing tactics and use little explanation or discussion to obtain child compliance. Children, in turn, may become increasingly defiant and such defiance may generalize to interactions with others outside of the family, influencing the behavior of those other individuals in ways that promote similarly negative interactions. For example, mothers of compliant children were found to become more controlling and less likely to engage in verbal problem-solving tactics with noncompliant children than with their own children (Gauvain, 1997).

Developmental milestones and developmental delays. As with motor and cognitive development, there are developmental milestones in socio-emotional development, some of which appear to have implications for future intellectual as well as social development. Data from the 1988 National Health Interview Survey indicated that 71 percent of parents whose children had a delay in growth or development first noticed it before the child turned three years old (Zill & Schoenborn, 1990).

Child referred or recommended for professional psychological evaluation. The number of children aged 3 to 17 who were treated for serious mental, emotional, or behavioral disorders has risen considerably over the past 10 years (Zill & Schoenborn, 1990). Children age 3 and under are more likely to be referred for an evaluation than for treatment, which is probably fairly rare at this early age. Psychological or psychiatric evaluation may indicate that a problem of some kind is suspected, which may predict later serious difficulties.

Behavior problems. Behavior problems in early childhood are related to negative outcomes later in development. A common distinction is made between "externalizing" problems and "internalizing" problems. Externalizing problems in early childhood include a variety of negative behaviors such as aggression, extreme noncompliance, and poor impulse child rearing. There is evidence that externalizing problems are stable from age 2 through the preschool years (Rose, Rose, & Feldman, 1989). Internalizing problems include excessive anxiety, fearfulness, shyness, and sadness or depression.

Aggressive behavior toward other children or parents. Instrumental forms of aggression are fairly common among very young children, and tend to decline with age while more hostile forms of aggression increase over the school years. Nonetheless, aggressive tendencies in childhood tend to be fairly stable and have been found to have serious implications for social adjustment (Olweus, 1979). Some studies have found stability in aggressive behavior as early as the second year of life (Cummings, Hollenbeck, Iannotti, Radke-Yarrow, & Zahn-Waxler, 1986; Hay & Ross, 1982). The causes of individual differences at early ages may include temperamental characteristics such as high activity level and reactivity. They may also be affected by coercive family interactions and conflict among family members. In turn, aggressive behavior that is beyond the norms for the peer group tend to lead to rejection by peers and general social maladjustment (Dodge, Pettit, McClaskey, & Brown, 1986), which may in turn promote continued aggressive tendencies (Crick & Dodge, 1994).

Prosocial behavior/play behavior/peer interactions/peer and sibling interactions. Prosocial behavior in peer interactions and among siblings of similar age are not extremely common among infants and toddlers. Nonetheless, studies have shown that not only are older infants and toddlers capable of behaving prosocially, but that early individual differences may show some consistency across settings with different partners, and they may be associated with similar individual differences in the preschool and school years (Eisenberg, 1992; Radke-Yarrow & Zahn-Waxler, 1984). Such differences, in turn, may affect the responses children receive from peers and adults, affecting overall school adjustment.

6d. Attachment

One aspect of early socio-emotional adjustment that has received particular attention is infant-parent attachment. Attachments are defined as affective bonds established over the course of the first year of life between an infant and one or a few care givers (see Ainsworth et al., 1978; Bretherton, 1985). The quality of infant-parent attachment has been linked to the sensitivity of maternal and paternal care giving. Of particular importance seems to be the adult's ability to respond contingently, consistently, and appropriately to infant signals.

A great deal of research has been conducted over the past several decades on the associations between early attachment quality and concurrent and later cognitive, social, and emotional functioning. Attachment security with the mother at 12 and 18 months has been found to be associated with concurrent and later exploratory behavior (Cassidy, 1986), persistence at challenging activities (Frankel & Bates, 1990; Matas, Arend, & Sroufe, 1978), and enjoyment expressed during mastery attempts (Belsky, Garduque, & Hrncir, 1984; Frodi, Bridges, & Grolnick, 1985). Preschoolers who were securely attached as infants and toddlers have been found to be more socially competent with peers (Suess, Grossman, & Sroufe, 1992). In kindergarten, children with a history of secure infant-mother attachment have been found to be more curious, more self-reliant, and to demonstrate greater eagerness in problem-solving situations (Arend, Gove, & Sroufe, 1979). Anxious attachments, in contrast, have been associated with dependent behavior, lack of exploratory behavior, negative emotion and poor emotion regulation, hostility, social isolation, and other aspects of social incompetence (Bretherton, 1985).

Although less research has accumulated regarding infant-father attachments, the available evidence indicates that the associations between the quality of infant-father attachment and other outcomes are similar to those found for mothers. Suess, Grossmann, and Sroufe (1992) found that attachment security with the father was associated with low levels of negativity and tension in preschool peer interactions, and a greater tendency to solve conflicts with peers without seeking intervention by teachers. Infant-father attachment quality and attachment-related behaviors have also been associated with sociability with adults (Bridges, Connell, & Belsky, 1988; Main & Weston, 1981) and with exploratory competence (Belsky et al., 1984).

It is important to note that attachment is seen as a characteristic of a relationship, rather than of the infant him- or herself (Bretherton, 1985). Thus, an infant can have different qualities of attachment with each parent, or with parents and other important care givers. Studies that have included assessments of both infant-mother and infant-father attachments have found that children who were securely attached to both parents in infancy are more sociable, and more socially competent than are children who were securely attached to only one parent. Generally, the associations between infant-mother attachment and later outcomes have been found to be stronger than those for infant-father attachment, but both appear to be important for young children's development (Parke, 1996).

7. EARLY HEALTH CARE, FEEDING PATTERNS, NUTRITION, & INSURANCE

One objective of the National Education Goals that were established by the president and Congress is to have children receive the adequate nutrition and health care necessary to be ready to learn in their first school experiences (National Education Goals Panel, 1995). There is a great deal of controversy over the extent of hunger among children (National Commission on Children, 1991a). However, no one would argue over the importance of meeting basic food needs. While children's nutritional needs continue to change over the course of childhood, early health care and feeding patterns have a long-term effect on both physical and intellectual development. For this reason, information on diet and health practices should be collected from birth to obtain a complete picture of a child's readiness to learn at the time that they enter school.

7a. Early Health Care Practices

Diet/Nutrition/Food Sufficiency/Vitamins. Inadequate nutrition among infants and young children is related to failure to thrive and may be associated with physical problems (such as iron-deficient anemia, stunting, and wasting), deficits in intellectual and socioemotional development, and may have lasting effects on a child's physical and mental health (Dwyer & Argent, 1990). Poor nutrition in the first months and years of life, a time when the brain is rapidly developing, may lead to intellectual impairment (Balazs et al., 1986; Sewell, Price, & Karp, 1993). Infants and toddlers who are undernourished have also been found to have substantially reduced levels of visual and physical exploration of their environment, which is associated with early cognitive development (Barrett et al., 1982; Cravioto & Arrieta, 1986). In some cases, child characteristics such as colic may make feeding difficult and lead to poor nutrition and growth. Malnutrition causes children to have shorter attention spans and sluggish responsiveness to social stimuli; these deficits interfere with their ability to elicit responses from others and their ability to learn in both structured and unstructured situations (Karp, in press). In addition, parents of infants who are malnourished have been found to provide lower levels of cognitive, social, and emotional stimulation to their infants (Wachs et al., 1992).

Children of disadvantaged parents, children of teenage mothers, and children whose parents are currently receiving welfare may be at a stronger risk of nutritional problems (Hofferth, 1987). Given the changing nature of welfare reform and cuts to federal funding of food stamps, it will be particularly important to examine the availability of basic nutrition for children from welfare families.

In order to assess issues of hunger and inadequate food resources, a national measure of household-based, poverty-related food insecurity and hunger in the U.S. has recently been developed by the Food and Consumer Service of the U.S. Department of Agriculture (Bickel, Andrews, & Klein, 1996). The Life Sciences Research Office issued a report in 1990 that provided a conceptual definition of food insecurity and security (Life Sciences Research Office, 1990, pp. 1575-6 as cited in Bickel, Andrews & Klein, 1996):

> Food security is defined as access by all people at all times to enough food for an active, healthy life and includes at a minimum: a) the ready availability of nutritionally adequate and safe foods, and b) the assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, and other coping strategies).
>
> Food insecurity exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain.

Breastfeeding/ Regularity of Eating Patterns. Breastfeeding and regular eating patterns are sources of early adequate nutrition levels among infants and toddlers. Breast milk contains antibodies to protect against illness, is associated with especially positive health outcomes among low birth weight infants, and, among mothers, lowers the chance of getting breast cancer later in life (Eiger & Olds, 1987). The American Academy of Pediatrics recommends that infants receive breast milk for the first 6 to 12 months of life (Glick, 1997). Despite the positive health outcomes among mothers and children, there is a lower incidence of breastfeeding among younger, poorer, less educated, and minority women (Eiger & Olds, 1987).

Another important component of nutrition for infants and toddlers is the regularity of eating patterns. Regular feedings among infants and regular mealtimes among toddlers are associated with nutritional adequacy and with general stability, which may protect the health and well-being of young children (Boyce et al., 1983; Maccoby & Mookin, 1992).

7b. Health Insurance and Care Usage

A child's health status is an important measure of child well-being. Changes in a child's health status may occur if income declines, if the parent's access to health care changes, or if parents are able to obtain health quality care as a result of being employed. Given the recent changes in welfare, it will be important to examine the availability of health care for children from welfare families.

Child's Immunization Status. Full immunization is an important measure of a child's general health and of health-care access. A decline in immunization rates is one of the leading causes of the increase in the incidence of preventable diseases among children and adolescents, especially those from poor families. The Centers for Disease Control and Prevention recommend that 80 percent of routine childhood vaccinations be administered within the first two years of life. Current provider-adjusted immunization estimates for 1994-1995 indicate that 75 percent of children ages 19 to 35 months received vaccinations (Brown & Stagner, forthcoming). African-American preschool age children are less often fully immunized than white preschool age children, and white infants have higher percentages of vaccination receipt than black children or children of other races (Brown & Stagner, forthcoming; National Commission on Children, 1993). In general, poor children are less likely than children at or above poverty to have received vaccinations, and are two to three times as likely to have delayed immunization (Starfield, 1992).

Immunization is one target of welfare reform efforts aimed at improving health among young children. Though it might seem straightforward to obtain reports of child immunization, it is actually very difficult to get accurate reports of immunization. Parental reports of immunization have limited reliability. Reporting can be improved if the parent is asked to refer to the immunization record and if detailed questions are asked about each type of recommended shot and when the shot was administered.

Access to Health Care. Access to health care is another factor in the quality of children's health (Coiro, Zill, & Bloom, 1994; National Commission on Children, 1993). Children who are covered by health insurance are also more likely to have a regular source of health care (National Center for Health Statistics, 1988). Regular health care increases the continuity of care, which is associated with more positive health outcomes. In 1995, 13 percent of children ages 0 to 5 years were not covered by any type of health insurance (Brown & Stagner, forthcoming).

Health insurance coverage varies by race/ethnicity and poverty status. Hispanic children are much less likely to be covered than either white or black children (Brown & Stagner, forthcoming). Thirty percent of all poor children under six have no health insurance at all (National Center for Children in Poverty, 1990). Frequency of visits to the doctor is related to income, especially for those families who earn too much to qualify for Medicaid, but too little to afford private insurance. Children in families with incomes between $10,000 and $20,000 were least likely to see a physician (National Commission on Children, 1993), and are more frequently taken to emergency rooms, which provide episodic care (National

Center for Children in Poverty, 1990). In addition, low-income and minority families living in urban areas face other barriers to health care including lack of transportation and language differences (National Commission on Children, 1993). Furthermore, although children in general are also at risk of accidental injury (National Commission on Children, 1993), children growing up in poverty are at higher risk of accidental injury (Klerman, 1991).

8. DISTAL CONSTRUCTS

An ecological model views the neighborhood as one of a number of contexts that can have important implications for children's development (Bronfenbrenner, 1979). Besides the direct impact of such factors as social networks with neighbors, facilities available to the child and their parents, and the overall safety of the environment, neighborhood factors also affect such mediating variables as parenting practices and parental psychological well-being. For this reason they may have a strong impact even before the child is actively engaged outside the home.

8a. Neighborhood Resources. There are several theories that have been developed to explain the association between neighborhood characteristics and child outcomes (Crane, 1991; Duncan, 1994; Jencks & Mayer, 1990; Mayer & Jencks, 1989; Wilson, 1987). Many of these theories suggest that affluent neighbors will provide benefits for children and their families, particularly low-income ones. This may occur through socialization or through the presence of neighborhood institutions (such as libraries, high quality schools, and parks) that are associated with higher income. For instance, a public library offers households an additional resource to aid in the development of all members of the family. For adults, a library may offer literature on better parenting, children's needs and development, as well as resources to obtain better employment. For very young children, a public library may represent an opportunity to listen to their parent(s) read to them, offering a head start to cognitive development and learning. Other theories outline how neighbors in low-income areas may compete for resources, and use an epidemic model to explain the contagion of negative behavior patterns found in these areas (Duncan et al., 1994). Wilson (1987; 1991) describes an inner-city underclass which is characterized by high rates of poverty, greater concentrations of African American and Hispanic families, and social isolation. The underclass "...are individuals who lack training and skills and either experience long-term unemployment or are not members of the labor force, individuals who are engaged in street crime and other forms of aberrant behavior, and families that experience long-term spells of poverty and/or welfare dependency" (Wilson, 1987, p. 8). Public housing projects in particular intensify problems, such as welfare dependency, single-parent families, teenage childbearing, and school dropout, that are found in inner-city neighborhoods. Children who grow up in these urban ghettos are deprived of basic services such as schools, playgrounds, clubs, and stores, and do not interact with employed or educated people on a regular basis.

Access to resources within a neighborhood can have a major impact on child and family well-being. For example, access to public transportation may make the difference between a low-income family spending their food stamps on higher priced groceries at a corner convenience store versus at a large grocery store chain where food prices are lower and their food stamps go farther. Public transportation could also mean increased job opportunities by expanding the area of possible job locations. Access to a library offers households an additional resource to aid in the development of all members of the family. For adults, a library may offer literature on better parenting; children's needs and development; as well as resources to attain better employment. For very young children, a public library may represent an opportunity to listen to their parent(s) read to them--offering a head start to cognitive development and learning. In addition, the availability of safe places to play in the area (e.g., parks, playgrounds, fields) affords opportunities for stimulating motor, cognitive and social activities for children.

Previous research has demonstrated that neighborhood characteristics, such as the high concentration of low income households, the presence of public housing and the absence of resources, are associated with risks to healthy development in children. For example in one study, a high concentration of poverty in a neighborhood was related to a higher risk of low birth weight, primarily through its association with crime and births to unmarried mothers (Coulton & Pandey, 1992). For young children, a higher presence of affluent neighbors is associated with higher test scores, whereas the presence of more low-income neighbors is related to more problem behavior (Duncan et al., 1994). In recent work by Brooks-Gunn, Duncan, Klebanov and Sealand (1993), evidence was found in two data sets (the Infant Health and Development Program and the Panel Study of Income Dynamics) of neighborhood effects on childhood IQ.

Neighborhood characteristics may also interact with child and family variables. For example, children in disadvantaged communities may be more strongly affected by parenting practices than children in more advantaged communities. Garbarino and Kostelny (1992) found that the rate of reported child abuse in the poorest areas is four times higher than the rate in more affluent areas.

8b. Neighborhood Quality and Safety. Research indicates that substantial variation exists across low income neighborhoods in terms of social characteristics, even when mean income in differing neighborhoods is comparable (Coulton & Pandey, 1992; Furstenberg, 1993; Garbarino & Crouter, 1978; Garbarino & Sherman, 1980). Further, there is some evidence that these social characteristics are related to risks for children. Such factors as whether a neighborhood has a long history of poverty or has only recently become a low income area and the percentage of single mothers in a neighborhood have been found to be related to key child outcome variables (e.g. rates of child maltreatment). Children in poor neighborhoods, especially those in public housing developments, are more likely than their peers to witness, or be victims of, violent crime (Garbarino & Kostelny, 1992). Neighbors in such neighborhoods are less likely to engage in what Wilson (1987; 1991) calls "reciprocal guardian behavior" in which neighbors look out for each other and their children. Mothers' sense of reciprocal involvement with other neighborhood mothers in the care and supervision of children have been found to be related to key child outcome variables. Parental adaptations to the immediacy of violence in the poorest urban areas include staying close to their children, as well as restricting children's movement in the neighborhood (Garbarino & Kostelny, 1992). A small study of New York neighborhoods over the past 50 years found that neighborhood supportiveness for children's play had declined substantially (Gaster, 1991); access of children to their neighborhoods decreased while parental restrictions increased.

Neighborhoods may also differ greatly in their degree of safety for young children. Motor vehicle accidents, including being hit by a car, are a leading cause of death for young children. Urban areas with a high density of motor vehicle traffic present particular risks (Rivara, Bergman & Drake, 1989), and such areas are also more likely to be affected by environmental pollution and unsanitary conditions on streets and playgrounds. Increased stress due to overcrowding, traffic and noise affects the health status of both children and their parents.

8c. Housing-Related Health Risks. Higher percentages of substandard and public housing are predictors of the risk of infant death (Coulton & Pandey, 1992). The presence of such housing is an indicator of neighborhood income but also of potential risks to children's health and safety. One severe health risk of substandard housing is the presence of lead paint. Lead poisoning, which affects the central nervous system and has a severe impact on learning ability, is common in many inner city neighborhoods and is particularly likely to affect African American children. The effects of lead poisoning on the central nervous system are compounded when combined with inadequate nutrition, particularly iron deficiency, and tend to be present on a community-wide basis (Harris, Clarke & Karp, 1993; Needleman & Gatsonis, 1990; Sewell et al., 1993). Children who are exposed to even moderate amounts of lead in early childhood later exhibit six-fold increases in reading disability, seven-fold increases in school drop-out rates, and lower final high school class standing (Needleman, Schell, Bellinger, Leviton, & Allred, 1990).

Besides the child safety risks inherent to substandard housing, a lack of precautions in the home and the absence of child-proofing enhancements are strongly related to children's accidents, injuries and deaths. Such household injuries have been found to disproportionately occur in certain families, indicating that preventative measures can have a significant effect (Papalia & Olds, 1992; Schor, 1987).

Domain Matrices

Note: ***The Birth Cohort Study*** is a longitudinal study proposed to study children birth through grade 1. Therefore the constructs listed in the grid may not be scheduled for study until beyond Year 2. Consequently, not all constructs will be indicated for measurement in the timing of these Domain Matrices. Furthermore, not all of the items listed in the matrices have separately marked descriptions in the Rationale Section.

Domain 1: Demographic Background

Construct 1a: Age, Gender, Race/Ethnicity			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1a-1 - Child's race/ethnicity and Hispanic origin	✓		
1a-2 - Biological mother's race/ethnicity and Hispanic origin	✓		
1a-3 - Biological father's race/ethnicity and Hispanic origin	✓		
1a-4 - Child's gender	✓		
1a-5 - Father's date of birth	✓		
1a-6 - Child's date of birth	✓		
1a-7 - Mother's date of birth	✓		
See also: *2a. Household composition* *2d. Parents' childbearing history*			

Construct 1b: Immigration History			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1b-1 - Immigration history, mother, father, grandparents	✓		
1b-2 - Country of origin, mother, father, grandparents	✓		
1b-3 - Reason for immigrating (political, economic)			
1b-4 - Length of residence in the U.S. and U.S. citizenship	✓	✓	✓
1b-5 - Parents' proficiency in English	✓		✓
1b-6 - Language use	✓	✓	✓
1b-7 - Language preference for child (including attitudes about the use of English)			✓

Construct 1c: Grandparent Characteristics (education, country of origin, # of kids)			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1c-1 - Education of all grandparents		✓	
1c-2 - Country of origin of all grandparents (or immigration status Y/N; see 1b)		✓	
1c-3 - Number of children of all grandparents		✓	
1c-4 - Race/ethnicity, Hispanic origin of all grandparents		✓	
1c-5 - Age of all grandparents		✓	
See also: 3j. Child relationships with grandparents			

Construct 1d: Parents' Education and Training, Educational Aspirations for Selves, Cognitive Attainment			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1d-1 - Education of mother and father (attainment and country where educated) (U.S. or not)	✓	✓	✓
1d-2 - Job training of mother and father	✓		✓
1d-3 - Educational aspirations and expectations for self (mother and father)	✓		✓
1d-4 - Cognitive attainment Learning disabilities Difficulties in school	✓		
1d-5 - Parents' current school attendance	✓	✓	✓
1d-6 - Parents' current job training	✓	✓	✓
See also: 3c. Parents' expectations for child's development			

Construct 1e: Employment			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1e-1 - Parents' current employment/unemployment	✓	✓	✓
1e-2 - Number of jobs currently held	✓	✓	✓
1e-3 - Parents' current occupation	✓	✓	✓
1e-4 - Number of hours worked/week	✓	✓	✓
1e-5 - Non-traditional work hours	✓	✓	✓
1e-6 - Steady vs. intermittent employment	✓	✓	✓
1e-7 - Fringe benefits/family leave policy	✓	✓	✓
1e-8 - Mother's preference for and attitudes toward work	✓	✓	✓
See also: *4a. Type, cost and travel time to child care* *4b. Extent*			

Construct 1f: Income & Wages			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1f-1- Wages (dollar per hour), income (total from all sources) and assets	✓	✓	✓
1f-2 - Annual earnings	✓	✓	✓
1f-3 - Unemployment compensation	✓	✓	✓
1f-4 - Child support agreement between parents (formal or informal)	✓	✓	✓
1f-5- Child support from absent parent: monetary assistance	✓	✓	✓
1f-6- Child support from absent parent: nonmonetary assistance (such as providing diapers, clothing)	✓	✓	✓
1f-7 - Financial hardship	✓	✓	✓

Construct 1g: Public Assistance			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
1g-1 -Welfare (TANF) , Medicaid, WIC, Food Stamps and other public transfers	✓	✓	✓
1g-2 - State-Supported Health Insurance Plans	✓	✓	✓
1g-3 - Public housing; subsidized housing	✓	✓	✓
1g-4 - Private assistance (charities, food banks, etc.)	✓	✓	✓
1g-5 - Family assistance (e.g., live with family member rent free/reduced rent; received cash assistance intermittently/regularly; received in kind assistance (e.g., groceries, free child care, etc.))	✓	✓	✓
1g-6 - Awareness of TANF Restrictions (e.g., how long can a family remain on welfare)	✓	✓	✓
See also: 4a. Type, cost and travel time to child care			

Domain 2: Family Organization, Composition, History/Turbulence

Construct 2a: Household Composition			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2a-1 - Household roster or composition (age, sex, relationship to child -- including pre-conception)	✓	✓	✓
2a-2 - Presence in household of non-family members who play a large role in the child's life		✓	✓
2a-3 - Number of adults in household	✓	✓	✓
2a-4 - Number of children in household	✓	✓	✓
2a-5 - Information on adults no longer living in the household		✓	✓
2a-6 - Information on children no longer living in the household (e.g., in foster care, living with relative)			
See also: *1a. Age, gender, race/ethnicity* *2c. Child's history of living arrangements* *2d. Parents' childbearing history* *3j. Child relationships with nonresidential biological parent, grandparents, and other kin*			

Construct 2b: Marital and Cohabitation Status/History			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2b-1 - Currently/ever married to biological father/mother	✓		
2b-2 - Marital status at birth (to biological father/mother)	✓		
2b-3 - Life events: Marriage Marital separation (from biological father) Cohabitation (with biological father vs. others) Divorce (from biological father) Remarriage (biological father vs. others)	✓	✓	✓
2b-4 - Age or date of first marriage	✓		
2b-5 - Age or date at separation	✓		
2b-6 - Age or date at divorce	✓		
2b-7 - Age or date at first cohabitation	✓		

Construct 2c: Child's History of Living Arrangements			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2c-1 - Child's history of living arrangements (ever lived apart from biological mother/biological father) with whom lived (including foster care)		✓	✓
2c-2 - Number of household moves for child		✓	✓
2c-3 - Reasons for Household Moves			
2c-4 - Tenure at current address	✓		
2c-5- Child custody arrangements: Joint custody Visitation rights for non-residential parent	✓	✓	✓
See also: 2a. Household composition			

Construct 2d: Parents' Childbearing History

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2d-1 - Mother's & father's age at first birth	✓		
2d-2 - Mother's & father's age at child's birth	✓		
2d-3 - Age when first became stepmother/stepfather, foster mother/father or guardian (for non-biological parents only)	✓		
2d-4 - Number of children ever born/sired	✓		✓
2d-5 - Mother's history of miscarriages (number, age of mother)	✓		✓
2d-6 - Use of fertility drugs	✓		
2d-7 - Birth order of all children	✓		
2d-8 - Spacing between births of all children	✓		✓
2d-9 - Number of siblings in household and elsewhere; biological relationships	✓	✓	✓
2d-10 - Presence of own children in household	✓	✓	✓
2d-11 - Age of all children in household	✓		✓
See also: *1a. Age, gender, race/ethnicity* *2a. Household composition* *3k. Sibling characteristics; sibling adjustment to baby*			

Construct 2e: Circumstances of Conception, Pregnancy & Delivery			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2e-1 - Intendedness of conception (both mother and father) including attitude about pregnancy (happy/unhappy)	✓		
2e-2 - Delivery problems, monitoring, duration	✓		
2e-3 - Use of labor-halting medications, medical aids to conception and pregnancy maintenance	✓		
2e-4 - Mother's Relationship with biological father at conception, during delivery	✓		
2e-5 - Problems during pregnancy (gestational diabetes, high blood pressure, etc)	✓		
2e-6 - Gestational age	✓		
2e-7 - Home visits, assistance from health care professionals	✓		
2e-8 - Number of days in hospital after birth of target child	✓		
2e-9 - Mode of delivery	✓		
2e-10 - Pre-pregnancy maternal height and weight	✓		
See also: 2h. Parental health-related risk behaviors			

Construct 2f: Child's Health Status at Birth

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2f-1 - Birth Weight, Length	✓		✓
2f-2 - Health of child at birth or soon after birth Reflexes and behaviors (Apgar) Colic	✓		
2f-3 - Prematurity or intensive care at birth	✓		
2f-4 - Head circumference	✓		
2f-5 - Length of stay in hospital after birth	✓		
2f-6 - General questions about problems	✓		
2f-7 - Well-baby check-up	✓		
See also: 5b. Health limitations and disabilities *6a. Health of child* *7a. Early health care practices*			

Construct 2g: Parental Psychological Well-Being			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2g-1 - Depressive symptomatology	✓		✓
2g-2 - Professional psychological/psychiatric treatment	✓		✓
2g-3 - Parent's perception of parenting aggravation and stress	✓		✓
2g-4 - Job Stress:			
Security		✓	
Conflict with coworkers/supervisors		✓	
Positive/negative feedback for involvement with child care		✓	✓
Scheduling conflicts with child care		✓	✓
2g-5 - Subjective economic stress	✓		✓
2g-6 - Parental coping skills	✓		✓
2g-7 - Stress/anxiety related to parenting role	✓		✓
2g-8 - Self esteem		✓	✓
2g-9 - Locus of control		✓	✓
2g-11 - Stressful Life Events		✓	✓

Construct 2h: Parental Health and Health-Related Risk Behaviors

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
2h-1 - Seat belt, car seat usage	✓		✓
2h-2 - Use of Prenatal Care: Weight gain Smoking (both mothers and fathers) Nutrition	 ✓ ✓ ✓		
2h-3 - Others smoking in household (and where child spends time)	✓	✓	✓
2h-4 - Substance use & abuse: Alcohol Tobacco Other drugs	 ✓ ✓ ✓		 ✓ ✓ ✓
2h-5 - Chronic Conditions	✓		✓
2h-6 - General Health	✓		✓
2h-7 - Restriction of Activities	✓		✓
2h-8 - Participation in prenatal care programs	✓		
2h-9 - Post-partum checkup Y/N	✓		
2h-10 - Birth control use post-partum	✓		
See also: 2e. Circumstances of conception, pregnancy, and delivery			

Domain 3: Family Process

Construct 3a: Cognitive Stimulation: Activities[1]			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3a-1 - Frequency of verbal interaction between parents and child:			
Singing	✓	✓	✓
Playing games		✓	✓
Talking	✓	✓	✓
Reading books, showing pictures, wordless baby books		✓	✓
Telling stories	✓	✓	✓
3a-2 - Use of structured educational materials (flash cards, computer)		✓	✓
3a-3 - Teaching counting, colors, shapes, alphabet		✓	✓
3a-4 - Shared activities (outings to park and museums, picnics, exercising, shopping, eating, playing, holidays, helping with chores)	✓	✓	✓
3a-5 - Arranging play groups or other interaction with peers, adults		✓	✓
3a-6 - Hours that TV, radio, video are on	✓	✓	✓
Hours TV, radio, video are on at different time of day, week	✓	✓	✓
How often do you and child discuss the programs they watch			✓
Specific educational programs			✓
3a-7 - Parent's time spent reading to self: parent reading for pleasure parent difficulties with reading parent reading while child present	✓	✓	✓
3a-8 - Family use of library		✓	✓
See also: 3f. Structuring of the home environment *3o. Time use*			

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[1] Note that information should be collected about the biological mother, biological father, and other parent figures in the household.

Construct 3b: Cognitive Stimulation: Materials[1]

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3b-1 - Number of children's books:			
Coloring books		✓	✓
Picture books	✓	✓	✓
Story books		✓	✓
3b-2 - Family receipt of newspaper, magazines	✓		
3b-3 - Presence of audio, video, and electronic equipment:	✓		
VCR			
CD or tape player			
Computer			
3b-4 - Presence of a variety of:	✓	✓	✓
Developmental, age-appropriate toys (e.g., push-pull, mobiles, puzzles, building blocks; see HOME)			
Musical instrument for child to use			
Crayons and paper			
See also: 3n. Gender typing			

Construct 3c: Parents' Expectations for the Child's Development			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3c-1 - Educational aspirations and expectations for child	✓		✓
3c-2 - Attitudes about the value and importance of education	✓		✓
3c-3 - Attitudes about learning and memorizing versus exploring and experimenting			✓
3c-4 - Importance of academic and social skills before kindergarten			✓
3c-5 - Knowledge / awareness about infant / child development (developmental milestones and child rearing attitudes measure)	✓	✓	✓
3c-6 - Appropriate expectations for child's development status (e.g., toilet training, ability to sit quietly)	✓	✓	✓
3c-7 - Parents' (both mother's and father's) motivation for involvement	✓	✓	✓
3c-8 - Parental attitudes and values about childrearing	✓		✓
3c-9 - Reading materials about child development (own or from library):			
Books about pregnancy, prenatal period	✓		
Books about early child development	✓		✓
Parenting magazine	✓		✓
3c-10 - Parent questions on child's growth weight, physical activity	✓	✓	✓
See also: 1d. Parents' education and training			

Construct 3d: Discipline

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3d-1 - Disciplinary practices:			
Use of harsh discipline vs. other approaches		✓	✓
Type of discipline (spanking, talking)		✓	✓
Rewards for good behavior			✓
Timeouts			✓
3d-2 - Frequency of disciplinary practices		✓	✓
3d-3 - Number of spankings in past week		✓	✓
3d-4 - Age at first spanking		✓	✓
3d-5 - Consistency of discipline		✓	✓
3d-6 - Parental control:			
"Firm" vs. "Coercive"			✓
Degree of supervision	✓	✓	✓
3d-7 - Child's response to discipline		✓	✓
See also: 3e. Warmth, physical affection and emotional supportiveness *3f. Structuring of the home environment*			

Construct 3e: Warmth, Physical Affection & Emotional Supportiveness			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3e-1 - Affection (loving, hugging, kissing, cuddling, tickling, eye contact, smiling, patience, praise)	✓	✓	✓
3e-2 - Warmth (including parental openness and encouragement of child)	✓	✓	✓
3e-3 - Presence of positive interaction; lack of negative practices	✓	✓	✓
3e-4 - Parents' sensitivity to child's state (either positive or negative) Parents' response to child's crying	✓	✓	✓
3e-5 - Closeness with absent parent, amount of visitation		✓	✓
3e-6 - Hostile / ineffective parenting			✓
3e-7 - Consistent parenting			✓
See also: 3d. Discipline *3j. Child's relationships with non-residential biological parent*			

Construct 3f: Structuring of the Home Environment

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3f-1 - Parental rules about television, radio, video being on			✓
Number of hours television is on			
Number of hours child watches television			
3f-2 - Restrictiveness vs. autonomy support		✓	✓
Parent lets child:			
Choose food to eat			✓
Choose clothes to wear			✓
Feed self		✓	✓
Play on floor, out of playpen		✓	✓
Explore the home environment		✓	✓
Choose toys to play with		✓	✓
Outside play vs. inside play			✓
3f-3 - Parent structures home environment to allow child freedom vs. expects child to adapt to adult environment	✓	✓	✓
3f-4 - Monitoring/supervision	✓	✓	✓
See also: 3a. Cognitive stimulation *3d. Discipline*			

Construct 3g: Family Routines			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3g-1 - Scheduling of meals, snacks	✓	✓	✓
3g-2 - Regular bedtime		✓	✓
3g-3 - Regular naps or rest time	✓	✓	✓
3g-4 - Planning (birthdays, vacations, education, holidays, saving for future, scheduling time, buying gifts)	✓	✓	✓
3g-5 - Parent leaves/comes home from work at regular times			
See also: 3o. Family time use			

Construct 3h: Attitudes about Culture, Ethnicity & Race			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3h-1 - Cultural/racial/ethnic identity: Celebrating cultural/ethnic holidays Story telling re: past family members Historical/cultural events			✓
3h-2 - Ethnic/racial socialization			✓

Construct 3i: Morality, Spirituality & Religiosity			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3i-1 - Parents' religiosity	✓		✓
3i-2 - Moral and ethical guidance (advising, role modeling, spiritual teaching, disciplining)			✓
3i-3 - Attendance at religious services, activities with child			✓
3i-4 - Religion: identification with a particular religion	✓		✓

Construct 3j: Child Relationships with Nonresidential Biological Parent, Grandparents, and Other Kin			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3j-1 - Contact with biological parent not in household:			
Regularity of contact		✓	✓
How often child has seen biological parent in the past year			
Length of time since last contact			
How long since biological parent lived with child			
Quality of contact			
3j-2 - Nonresidential biological parent's motivation to be involved with child	✓	✓	✓
3j-3 - Grandparent contact:			
Number of living grandparent(s)	✓	✓	✓
Proximity of grandparent(s)	✓	✓	✓
Time child spends with grandparent(s)	✓	✓	✓
Closeness of child's relationship with grandparent(s)		✓	✓
Visiting arrangements (who visits whom)		✓	✓
3j-4 - Contact with other kin, extended family:			
Proximity	✓	✓	✓
Time child spends with other kin	✓	✓	✓
Closeness of child's relationship with other kin		✓	✓
Visiting arrangements		✓	✓
See also: *1c. Grandparent characteristics* *2a. Household composition* *2b. Marital and cohabitation status/history* *3e. Warmth, physical affection, & emotional supportiveness*			

Construct 3k: Sibling Characteristics; Sibling Adjustment to Baby			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3k-1 - Sibling relationships			✓
3k-2 - Sibling adjustment to baby	✓	✓	
3k-3 - Sibling characteristics (age, sex, disability/limiting conditions)	✓	✓	✓
See also: 2d. Parents' childbearing history			

Construct 3l: Parenting and the Neighborhood; Family Involvement with Neighbors, Friends, Community			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3l-1 - Knows other parents in neighborhood	✓	✓	✓
3l-2 - Parents look out for each other's children			✓
3l-3 - Choice of neighborhoods influenced by school	✓		✓
3l-4 - Family involvement with: Neighbors Friends Community (church, recreational)		✓	✓
3l-5 - Choice of neighborhoods influenced/constrained by resources			✓
See also: 8a. Neighborhood resources *8b. Neighborhood quality and safety*			

Construct 3m: Parental and Other Family Relationships

Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3m-1 - Parents' marital satisfaction		✓	✓
3m-2 - Family conflict: Between parents in home Partners in the home Other family members Biological parents who don't reside in the same household Parent - child conflict Unresolved conflict Marital withdrawal		✓	✓
3m-3 - Conflict resolution styles		✓	✓
3m-4 - Social Supports from partner, relatives, and friends (type of support; frequency/amount; satisfaction with support) Emotional support for the parent Material assistance on a regular basis Material assistance in case of emergency Social support for childrearing	✓	✓	✓
3m-5 - Person who is like a mother/father to the child		✓	✓
3m-6 - Perceptions of the availability of social supports:			
During pregnancy			
At birth	✓		
During infancy/toddler ages	✓		
		✓	✓
3m-7 - History (and current prevalence) of family violence	✓	✓	✓
3m-8 - Family cohesion	✓	✓	✓
3m-9 - Support of partner in parenting role	✓	✓	✓

Construct 3n: Gender Typing			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3n-1 - Gender specific clothing	✓		✓
3n-2 - Gender socialization			✓
3n-3 - Gender specific toys	✓	✓	✓
3n-4 - Parents' gender role attitudes	✓	✓	✓
See also: 3b. Cognitive stimulation: material			

Construct 3o: Family Time Use			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
3o-1 - Household tasks	✓	✓	✓
3o-2 - Parent socializing without the child			✓
3o-3 - Child-related maintenance (cleaning, repairing, laundering, ironing, cooking)	✓	✓	✓
3o-4 - Provision of child care: Who does what? (Feeding, diapering, bathing, dressing, taking to child care, bringing home from child care, medical appointments)	✓	✓	✓
3o-5 - Components of parental involvement: Interaction with child Accessibility to child Responsibility for child's care	✓	✓	✓
See also: 3a. Cognitive stimulation: activities *3g. Family routines*			

Domain 4: Child Care

Construct 4a: Type, Cost & Travel Time			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
4a-1 - Type of care (relative; nanny/babysitter; family day care; day care center; etc.)*	✓	✓	✓
4a-2 - Site of care (home; provider's home; center; church; school; etc.)*	✓	✓	✓
4a-3 - Back-up care (sick care; provider unavailable; non-traditional hours/shift work; etc.)	✓	✓	✓
4a-4 - Provider's name/permission to contact (to obtain provider characteristics)*	✓	✓	✓
4a-5 - Parent assessment of difficulty in finding care	✓	✓	✓
4a-6 - Payment for child care (cash; in-kind; subsidies; etc.)*	✓	✓	✓
4a-7 - Parent assessment of affordability of care/ whether would switch to less expensive care if available	✓	✓	✓
4a-8 - Who takes child to site of care (to; from)*	✓	✓	✓
4a-9 - Time traveling to site of care (to; from)*	✓	✓	✓
4a-10 - Parent assessment of convenience of care/ whether would switch to more convenient care if available	✓	✓	✓
4a-11 - Frequency that parent is late for work, misses work due to child care problems	✓	✓	✓
***Provider information**:*	✓	✓	✓
Number of licensed child care slots	✓	✓	✓
Sliding scale, subsidies (if, how much)	✓	✓	✓
Auspice of care (public, private, religious, non-profit, for-profit)	✓	✓	✓
See also: 1e. Employment			

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Construct 4b: Extent			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
4b-1 - Hours by type of care in a typical week*	✓	✓	✓
4b-2 - Number of months full-day and part-day by type of care*	✓	✓	✓
4b-3 - Age first in child care on a regular basis, full-day and part-day, by type of care*	✓	✓	✓
4b-4 - Full day/part day*	✓	✓	✓
See also: 1e. Employment			

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* *From child care calendar.*

Construct 4c: Quality			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
4c-1 - Relationship of parent to caregiver: Openness/frequency of communication	✓	✓	✓
4c-2 - Satisfaction with care/ perceptions of child care quality: If you could change child care providers, would you? Do you worry about safety, health, interactions? Does child resist going/ like going? Is child stimulated? Do problems with child care cause stress?	✓	✓	✓
4c-3 - Cultural fit: Value differences in approaches to care giving Religious similarities Language similarities Does caregiver show respect for parent's culture?	✓	✓	✓
4c-4 - Parental involvement in care	✓	✓	✓
4c-5 - Group size/child-adult ratio (Get from both parent and provider)	✓	✓	✓
***Provider information*:**			
Licensing/accreditation of program	✓	✓	✓
Staffing: *Adult/child ratio* *Group size*	✓	✓	✓
Curriculum: *Educational setting* *Developmentally appropriate activities*	✓	✓	✓
Staff educational achievement; child development training	✓	✓	✓
Staff experience	✓	✓	✓
Intentionality of caregiving role	✓	✓	✓
Authoritarian attitudes about care giving	✓	✓	✓
Staff turn-over	✓	✓	✓
Staff salaries	✓	✓	✓

* *Observed*

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Construct 4c: Quality			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
*Facilities:** *Quality and size of space and structure* *Equipment, materials, supplies*	✓	✓	✓
Safety and health of child care setting (target extreme cases of problems)	✓	✓	✓
Drop in policy	✓	✓	✓
Other training (e.g. CPR, first aid)	✓	✓	✓

* *Observed*

Construct 4d: Consistency/Turbulence			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
4d-1 - Number of arrangements and caretakers since birth*	✓	✓	✓
4d-2 - Stability of caretakers within primary care setting (staff turnover)*	✓	✓	✓
4d-3 - Number of times found another arrangement because of: Child's developmental needs Cost (need less expensive care) Provider stopped providing care		 ✓ ✓ ✓	 ✓ ✓ ✓
Provider information:			
Staff turnover	✓	✓	✓

Domain 5: Child Characteristics

Construct 5a: Temperament			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
5a-1 - Infant/child temperament	✓	✓	✓

Construct 5b: Health Limitations & Disabilities			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
5b-1 - Physical limitations	✓	✓	✓
5b-2 - Disabilities	✓	✓	✓
See also: *2f. Child's health status at birth* *6a. Health of child*			

Domain 6: Child Outcomes

Construct 6a: Health of Child; Physical Growth; Motor Development; Child Safety			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
6a-1 - Current height and weight	✓	✓	✓
6a-2 - Presence of physical or cognitive disabilities / limiting conditions or health problems, developmental delays	✓	✓	✓
6a-3 - Motor Development	✓	✓	✓
6a-4 - Accidents and injuries		✓	✓
6a-5 - Overall health	✓	✓	✓
6a-6 - Visits to doctor or clinic	✓	✓	✓
6a-7 - Motor skills (gross & fine)			✓
6a-8 - Sleep patterns / difficulties	✓	✓	✓
6a-9 - Eating patterns	✓	✓	✓
6a-10 - Poor growth/failure to thrive	✓	✓	✓
6a-11 - Does child take regular medication?			✓
6a-12 - Any hospitalization in past year		✓	✓
6a-13 - Feeding patterns / difficulties / reactions to foods	✓		✓
6a-14 - Presence of specific diagnosed conditions (e.g., asthma, diabetes, ADD/ADHD)			✓
See also: *2f. Health at Birth* *5b. Health limitations and disabilities* *7a. Early health care* *8c. Housing related health risks*			

Construct 6b: Child's Cognitive Development			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
6b-1 - Developmental milestones/developmental delays		✓	✓
6b-2 - Ability to communicate, vocabulary:			
Receptive language (responds correctly to "show me doggie," for example)		✓	✓
Parental check list of words that the child says			✓
6b-3 - Pre-literacy development / Early language skills	✓	✓	✓
6b-4 - Approach towards learning			✓
Curiosity			
Exploration			
Persistence at tasks			
6b-5 - Attention span			
How long child can stay on-task?			✓
Can child play on their own?			✓
Problems with attention			
6b-6 - Memory development			✓
6b-7 - Cognitive Abilities		✓	✓

Construct 6c: Child's Socioemotional Development			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
6c-1 - Discipline problems (including at Child Care)			✓
6c-2 - Developmental milestones	✓	✓	✓
6c-3 - Developmental delays	✓	✓	✓
6c-4 - Child referred or recommended for professional psychological evaluation			✓
6c-5 - Child anxiety / separation anxiety			✓
6c-6 - Aggressive behavior towards other children or parents (aggression / anxiety / hyperactivity)			✓
6c-7 - Prosocial behavior / play behavior/peer interactions/sibling interactions			✓
6c-8 - Child's emotion regulation: How easily upset? How easily soothed? Can he/she wait for rewards?			✓
6c-9 - Child's awareness of emotions and other people's feelings, empathy	✓	✓	✓
6c-10 - Behavior problems: conduct disorder, hyperactivity, physical aggression, inattention, opposition, sad/withdrawn, often frightened			✓

Construct 6d: Attachment			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
6d-1 - Attachment category (optional observational sub-study topic)		✓	✓
6d-2 - Child behavior			✓

Domain 7: Early Health Care, Feeding Patterns, Nutrition, & Insurance

Construct 7a: Early Health Care Practices			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
7a-1 - Diet (parents and child)	✓	✓	✓
7a-2 - Nutrition (parents and child)	✓	✓	✓
7a-3 - Food sufficiency for parents and child	✓	✓	✓
7a-4 - Vitamins	✓	✓	✓
7a-5 - Breast-feeding	✓	✓	✓
7a-6 - Regularity of child's eating patterns	✓	✓	✓
See also: 2f. Child's health status at birth *6a. Health of child*			

Construct 7b: Health Insurance and Care Usage			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
7b-1 - Immunization status	✓	✓	✓
7b-2 - Regular dental check-ups			✓
7b-3 - Routine health and dental care	✓	✓	✓
7b-4 - Regular physician or medical provider	✓	✓	✓
7b-5 - Health insurance coverage	✓	✓	✓
7b-6 - Emergency room visits	✓	✓	✓

Domain 8: Distal Constructs

Construct 8a: Neighborhood Resources			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
8a-1 - Places to play nearby (e.g. playground, park, field)		✓	✓
8a-2 - Availability of public transportation	✓	✓	✓
8a-3 - Availability of libraries	✓	✓	✓
8a-4 - Rating of house, neighborhood, education in local schools	✓	✓	✓
8a-5 - State, city, region, urbanicity	✓	✓	✓
8a-6 - Welfare receipt, poverty, income, unemployment in neighborhood (census data)	✓	✓	✓
See also: 3l. Parenting and the neighborhood			

Construct 8b: Neighborhood Quality & Safety			
Items:	**Timing**		
	Birth	**Year 1**	**Year 2**
8b-1 - Environmental pollution: GIS pollution data	✓		✓
8b-2 - Safe for children outside		✓	✓
8b-3 - Rating of personal safety in neighborhood	✓	✓	✓
8b-4 - Crime	✓	✓	✓
8b-5 - Children's exposure to violence (including domestic violence, street violence, school violence)	✓	✓	✓
8b-6 - Cleanliness	✓	✓	✓
8b-7 - Traffic and noise	✓	✓	✓
See also: 3l. Parenting and the neighborhood			

Construct 8c: Housing-Related Health Risks

Items:	Timing		
	Birth	Year 1	Year 2
8c-1 - Interviewer ratings of physical environment safety of the home	✓	✓	✓
8c-2 - Toxic exposures (physiologic measures)	✓	✓	✓
8c-3 - Hazards:			
Medicines within a child's reach		✓	✓
Peeling paint, lead paint		✓	✓
Poisons within reach		✓	✓
Open windows without screens		✓	✓
Pot/stove within toddler's reach			✓
8c-4 - Safety precautions:			
Smoke alarm	✓	✓	✓
Outlet covers		✓	✓
Cabinet locks		✓	✓
Chemical products (cleaning products, etc.) out of reach		✓	✓
See also: 6a. Health of child; physical growth; child safety			

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Listing of NCES Working Papers to Date

Please contact Angela Miles at (202) 219-1761 (angela_miles@ed.gov)
if you are interested in any of the following papers

Number	Title	Contact
94-01 (July)	Schools and Staffing Survey (SASS) Papers Presented at Meetings of the American Statistical Association	Dan Kasprzyk
94-02 (July)	Generalized Variance Estimate for Schools and Staffing Survey (SASS)	Dan Kasprzyk
94-03 (July)	1991 Schools and Staffing Survey (SASS) Reinterview Response Variance Report	Dan Kasprzyk
94-04 (July)	The Accuracy of Teachers' Self-reports on their Postsecondary Education: Teacher Transcript Study, Schools and Staffing Survey	Dan Kasprzyk
94-05 (July)	Cost-of-Education Differentials Across the States	William Fowler
94-06 (July)	Six Papers on Teachers from the 1990-91 Schools and Staffing Survey and Other Related Surveys	Dan Kasprzyk
94-07 (Nov.)	Data Comparability and Public Policy: New Interest in Public Library Data Papers Presented at Meetings of the American Statistical Association	Carrol Kindel
95-01 (Jan.)	Schools and Staffing Survey: 1994 Papers Presented at the 1994 Meeting of the American Statistical Association	Dan Kasprzyk
95-02 (Jan.)	QED Estimates of the 1990-91 Schools and Staffing Survey: Deriving and Comparing QED School Estimates with CCD Estimates	Dan Kasprzyk
95-03 (Jan.)	Schools and Staffing Survey: 1990-91 SASS Cross-Questionnaire Analysis	Dan Kasprzyk
95-04 (Jan.)	National Education Longitudinal Study of 1988: Second Follow-up Questionnaire Content Areas and Research Issues	Jeffrey Owings
95-05 (Jan.)	National Education Longitudinal Study of 1988: Conducting Trend Analyses of NLS-72, HS&B, and NELS:88 Seniors	Jeffrey Owings

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95-08 (Feb.)	CCD Adjustment to the 1990-91 SASS: A Comparison of Estimates	Dan Kasprzyk
95-09 (Feb.)	The Results of the 1993 Teacher List Validation Study (TLVS)	Dan Kasprzyk
95-10 (Feb.)	The Results of the 1991-92 Teacher Follow-up Survey (TFS) Reinterview and Extensive Reconciliation	Dan Kasprzyk
95-11 (Mar.)	Measuring Instruction, Curriculum Content, and Instructional Resources: The Status of Recent Work	Sharon Bobbitt & John Ralph
95-12 (Mar.)	Rural Education Data User's Guide	Samuel Peng
95-13 (Mar.)	Assessing Students with Disabilities and Limited English Proficiency	James Houser
95-14 (Mar.)	Empirical Evaluation of Social, Psychological, & Educational Construct Variables Used in NCES Surveys	Samuel Peng
95-15 (Apr.)	Classroom Instructional Processes: A Review of Existing Measurement Approaches and Their Applicability for the Teacher Follow-up Survey	Sharon Bobbitt
95-16 (Apr.)	Intersurvey Consistency in NCES Private School Surveys	Steven Kaufman
95-17 (May)	Estimates of Expenditures for Private K-12 Schools	Stephen Broughman
95-18 (Nov.)	An Agenda for Research on Teachers and Schools: Revisiting NCES' Schools and Staffing Survey	Dan Kasprzyk
96-01 (Jan.)	Methodological Issues in the Study of Teachers' Careers: Critical Features of a Truly Longitudinal Study	Dan Kasprzyk

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96-02 (Feb.)	Schools and Staffing Survey (SASS): 1995 Selected papers presented at the 1995 Meeting of the American Statistical Association	Dan Kasprzyk
96-03 (Feb.)	National Education Longitudinal Study of 1988 (NELS:88) Research Framework and Issues	Jeffrey Owings
96-04 (Feb.)	Census Mapping Project/School District Data Book	Tai Phan
96-05 (Feb.)	Cognitive Research on the Teacher Listing Form for the Schools and Staffing Survey	Dan Kasprzyk
96-06 (Mar.)	The Schools and Staffing Survey (SASS) for 1998-99: Design Recommendations to Inform Broad Education Policy	Dan Kasprzyk
96-07 (Mar.)	Should SASS Measure Instructional Processes and Teacher Effectiveness?	Dan Kasprzyk
96-08 (Apr.)	How Accurate are Teacher Judgments of Students' Academic Performance?	Jerry West
96-09 (Apr.)	Making Data Relevant for Policy Discussions: Redesigning the School Administrator Questionnaire for the 1998-99 SASS	Dan Kasprzyk
96-10 (Apr.)	1998-99 Schools and Staffing Survey: Issues Related to Survey Depth	Dan Kasprzyk
96-11 (June)	Towards an Organizational Database on America's Schools: A Proposal for the Future of SASS, with comments on School Reform, Governance, and Finance	Dan Kasprzyk
96-12 (June)	Predictors of Retention, Transfer, and Attrition of Special and General Education Teachers: Data from the 1989 Teacher Followup Survey	Dan Kasprzyk
96-13 (June)	Estimation of Response Bias in the NHES:95 Adult Education Survey	Steven Kaufman
96-14 (June)	The 1995 National Household Education Survey: Reinterview Results for the Adult Education Component	Steven Kaufman

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96-16 (June)	Strategies for Collecting Finance Data from Private Schools	Stephen Broughman
96-17 (July)	National Postsecondary Student Aid Study: 1996 Field Test Methodology Report	Andrew G. Malizio
96-18 (Aug.)	Assessment of Social Competence, Adaptive Behaviors, and Approaches to Learning with Young Children	Jerry West
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96-20 (Oct.)	1991 National Household Education Survey (NHES:91) Questionnaires: Screener, Early Childhood Education, and Adult Education	Kathryn Chandler
96-21 (Oct.)	1993 National Household Education Survey (NHES:93) Questionnaires: Screener, School Readiness, and School Safety and Discipline	Kathryn Chandler
96-22 (Oct.)	1995 National Household Education Survey (NHES:95) Questionnaires: Screener, Early Childhood Program Participation, and Adult Education	Kathryn Chandler
96-23 (Oct.)	Linking Student Data to SASS: Why, When, How	Dan Kasprzyk
96-24 (Oct.)	National Assessments of Teacher Quality	Dan Kasprzyk
96-25 (Oct.)	Measures of Inservice Professional Development: Suggested Items for the 1998-1999 Schools and Staffing Survey	Dan Kasprzyk
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97-04 (Feb.)	Design, Data Collection, Monitoring, Interview Administration Time, and Data Editing in the 1993 National Household Education Survey (NHES:93)	Kathryn Chandler
97-05 (Feb.)	Unit and Item Response, Weighting, and Imputation Procedures in the 1993 National Household Education Survey (NHES:93)	Kathryn Chandler
97-06 (Feb.)	Unit and Item Response, Weighting, and Imputation Procedures in the 1995 National Household Education Survey (NHES:95)	Kathryn Chandler
97-07 (Mar.)	The Determinants of Per-Pupil Expenditures in Private Elementary and Secondary Schools: An Exploratory Analysis	Stephen Broughman
97-08 (Mar.)	Design, Data Collection, Interview Timing, and Data Editing in the 1995 National Household Education Survey	Kathryn Chandler

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97-10 (Apr.)	Report of Cognitive Research on the Public and Private School Teacher Questionnaires for the Schools and Staffing Survey 1993-94 School Year	Dan Kasprzyk
97-11 (Apr.)	International Comparisons of Inservice Professional Development	Dan Kasprzyk
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97-13 (Apr.)	Improving Data Quality in NCES: Database-to-Report Process	Susan Ahmed
97-14 (Apr.)	Optimal Choice of Periodicities for the Schools and Staffing Survey: Modeling and Analysis	Steven Kaufman
97-15 (May)	Customer Service Survey: Common Core of Data Coordinators	Lee Hoffman
97-16 (May)	International Education Expenditure Comparability Study: Final Report, Volume I	Shelley Burns
97-17 (May)	International Education Expenditure Comparability Study: Final Report, Volume II, Quantitative Analysis of Expenditure Comparability	Shelley Burns
97-18 (June)	Improving the Mail Return Rates of SASS Surveys: A Review of the Literature	Steven Kaufman
97-19 (June)	National Household Education Survey of 1995: Adult Education Course Coding Manual	Peter Stowe
97-20 (June)	National Household Education Survey of 1995: Adult Education Course Code Merge Files User's Guide	Peter Stowe
97-21 (June)	Statistics for Policymakers or Everything You Wanted to Know About Statistics But Thought You Could Never Understand	Susan Ahmed
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97-40 (Nov.)	Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1996 National Household Education Survey	Kathryn Chandler
97-41 (Dec.)	Selected Papers on the Schools and Staffing Survey: Papers Presented at the 1997 Meeting of the American Statistical Association	Steve Kaufman
97-42 (Jan. 1998)	Improving the Measurement of Staffing Resources at the School Level: The Development of Recommendations for NCES for the Schools and Staffing Survey (SASS)	Mary Rollefson
97-43 (Dec.)	Measuring Inflation in Public School Costs	William J. Fowler, Jr.
97-44 (Dec.)	Development of a SASS 1993-94 School-Level Student Achievement Subfile: Using State Assessments and State NAEP, Feasibility Study	Michael Ross
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98-07 (May)	Decennial Census School District Project Planning Report	Tai Phan
98-08 (July)	The Redesign of the Schools and Staffing Survey for 1999-2000: A Position Paper	Dan Kasprzyk
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98-10 (Aug.)	Adult Education Participation Decisions and Barriers: Review of Conceptual Frameworks and Empirical Studies	Peter Stowe
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